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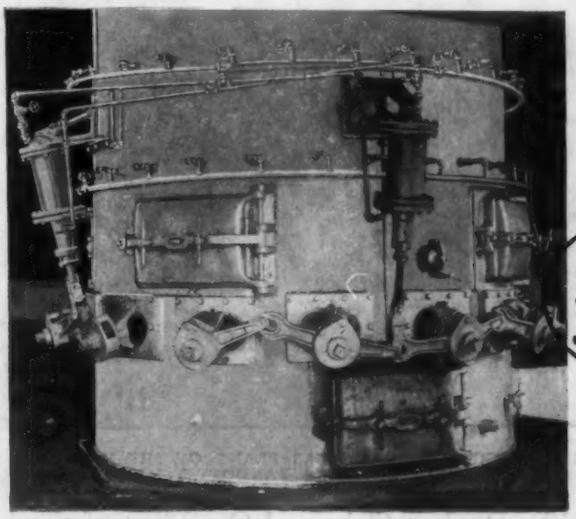
AMERICAN GAS JOURNAL

Established 1859 *Pioneer of the Gas Industry*

Including · GAS INDUSTRY · Est. 1900 ·



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This Combination Is the Answer to Your Clinkering Problem.

You cannot afford in dollars and cents to continue hand clinkering and barring down the side walls.

Our proposition is to install this equipment in your plant —if it is not worth the price you do not pay for it.

We consider this one of the best things we have done for the water gas industry.

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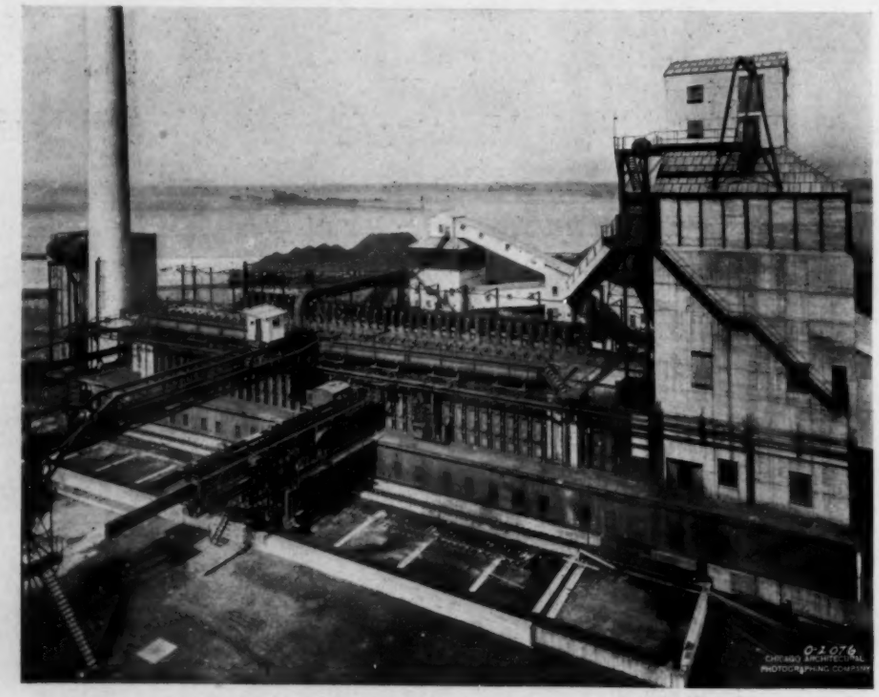
Michigan Alkali's New Becker Oven Plant



BY-PRODUCT COKE AND GAS PLANT OF THE MICHIGAN ALKALI COMPANY AT WYANDOTTE, MICHIGAN

THE By-Product Coke and Gas Plant of the Michigan Alkali Company at Wyandotte, Michigan, was placed in operation early this year. It consists of 39 Becker Type Combination Ovens with complete auxiliaries including by-product recovery plant, benzol, purification and material handling plants.

The installation which was designed and built by The Koppers Construction Company has a daily surplus gas capacity of over 5,000,000 cubic feet.

The Koppers Construction Company

Designers and Builders of
BY-PRODUCT COKE AND GAS PLANTS

Chicago **Pittsburgh** **New York**

AMERICAN
GAS JOURNAL
Established 1859 *Pioneer of the Gas Industry*
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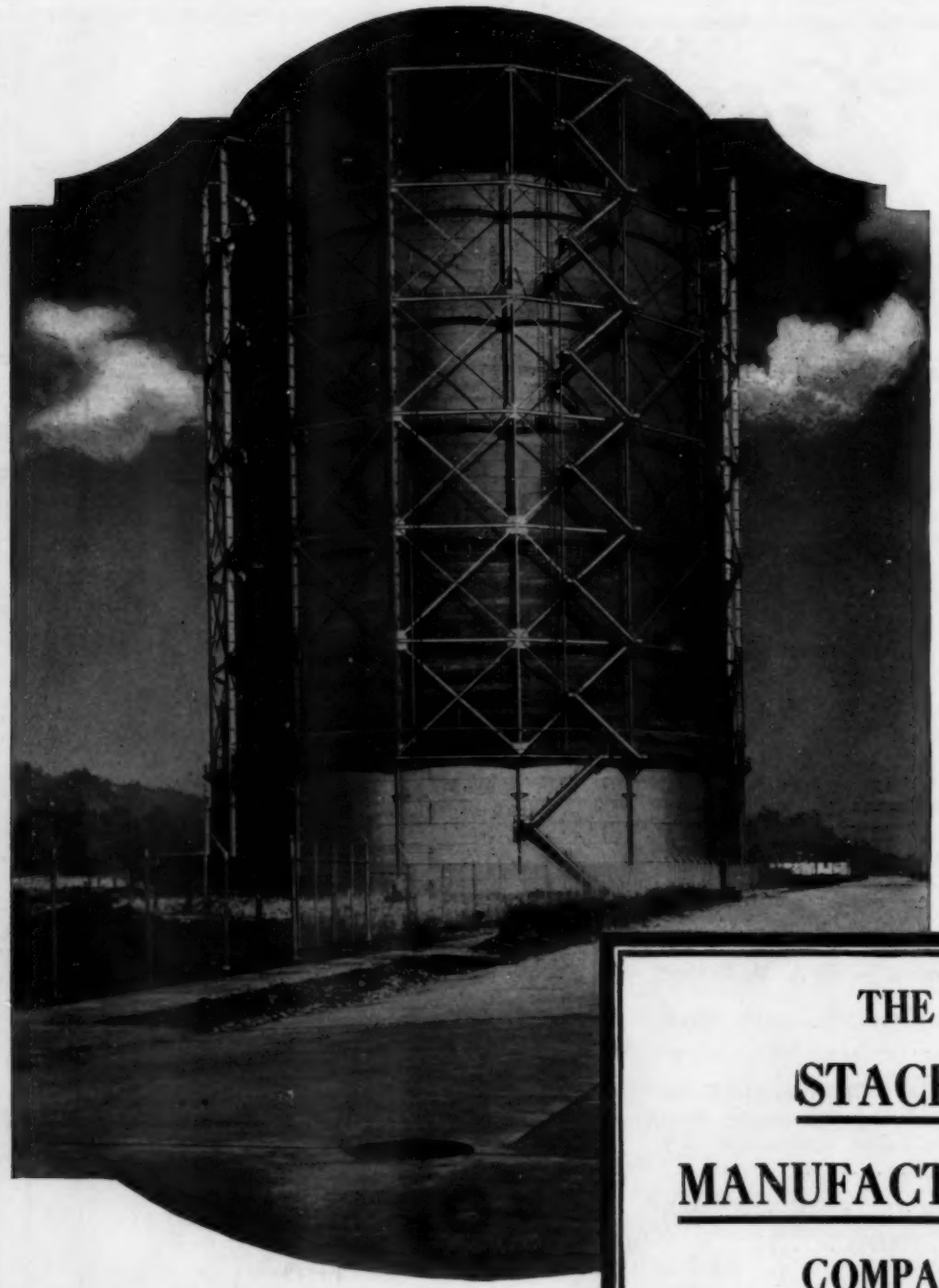

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Built for
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WHY THROW AWAY EXHAUST STEAM?

Every pound of exhaust steam used over means a corresponding saving in boiler coal.

SMOOT STEAM ACCUMULATOR AND CONTROL SYSTEM has made the use of exhaust steam in water gas manufacture practically standard practice.

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To Every Gas Plant

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For purposes of comparison of the service in water gas generator linings or other refractory construction, we shall be glad to furnish a trial quantity of ADAMANT-ADACHROME *Fines* for laying up the brick, and ADAMANT-ADACHROME for coating or surfacing the finished lining.

There are no strings to this offer. Our representatives will co-operate with you in the installation, rendering the helpful service that gas plant officials have obtained from Botfield Refractories Company for nearly a quarter-century.

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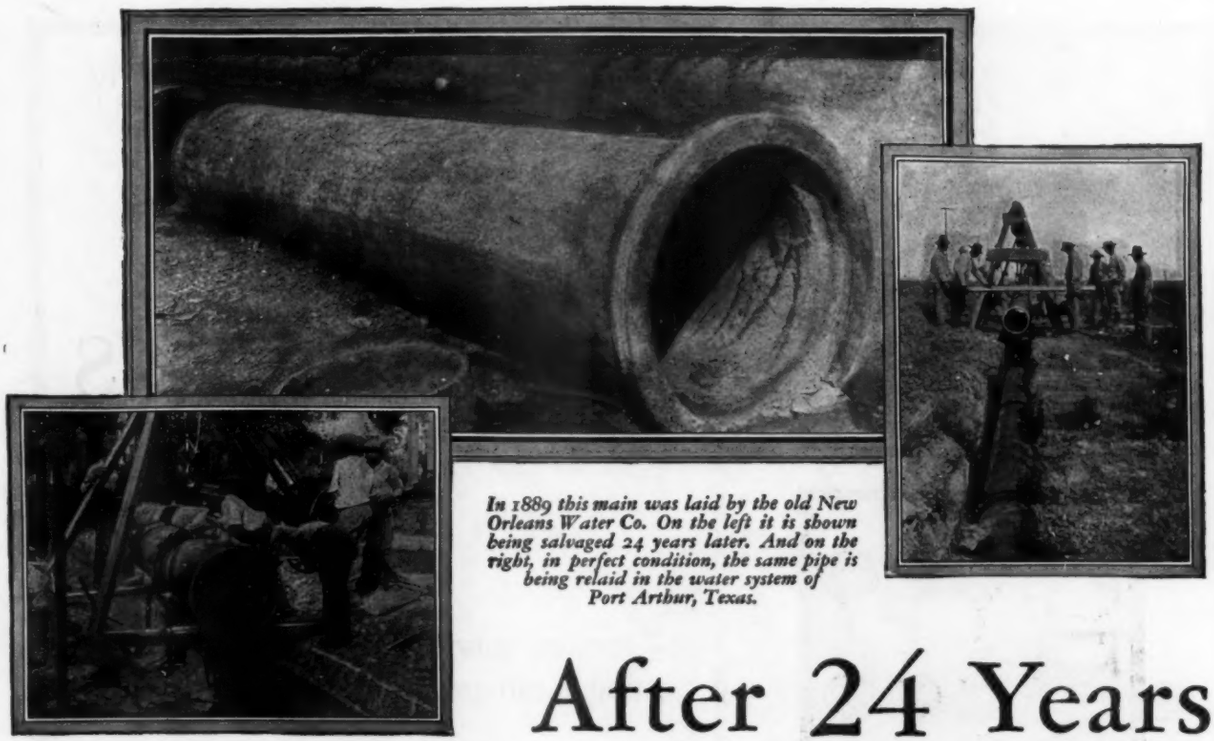
Whenever You Use a Fire Brick, Use ADAMANT, the Original High Temperature Cement



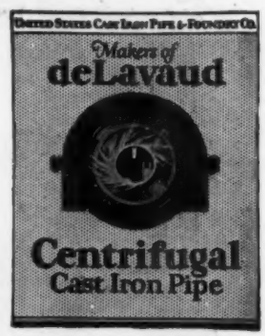
In 1889 this main was laid by the old New Orleans Water Co. On the left it is shown being salvaged 24 years later. And on the right, in perfect condition, the same pipe is being relaid in the water system of Port Arthur, Texas.

After 24 Years

this cast iron pipe starts a new job

USUALLY when cast iron pipe is laid, it is in the ground for good. It can be forgotten. A century or two of service is no uncommon record.

But, in rare instances, pipe lines must be removed as in the case of this main installed many years ago in New Orleans. The left-hand photograph shows it being taken out of the ground in perfect condition, after almost a quarter century of service. And at the right you see the same pipe starting again in service under the streets of Port Arthur, Texas. Nothing could illustrate more forcefully the age-defying quality of good cast iron pipe.



Much helpful data for the engineer and contractor is contained in the U. S. Cast Iron Pipe Handbook. Write for your copy now.

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for

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Air flow meter shows amount of air supplied per minute to the generator.

Pyrometer indicates temperature of checker brick.

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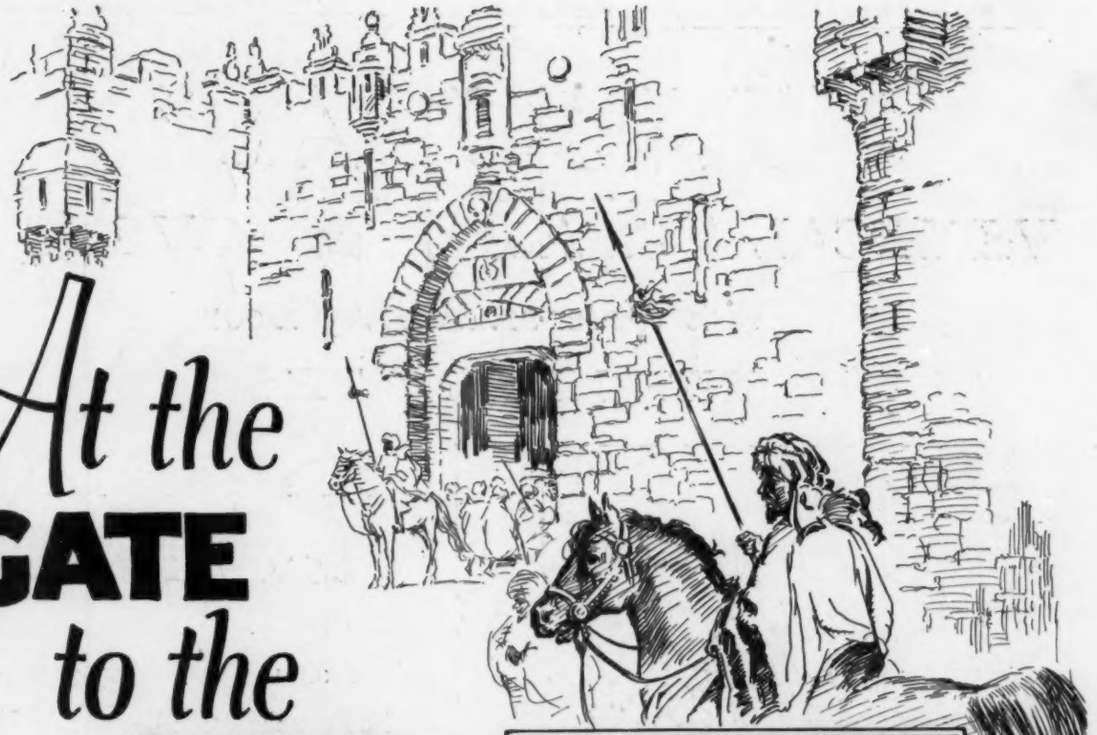
CLEVELAND, OHIO



At the GATE *to the* CITY

Where gas from the pipe line is delivered into the city distribution system, is the place you need those dependable watchmen, the

Connersville Meters

Rugged in construction, of simple design and with unvarying displacement, they will serve you with as little worry on your part as does the Connersville Meter on the city gate at Lima, Ohio.

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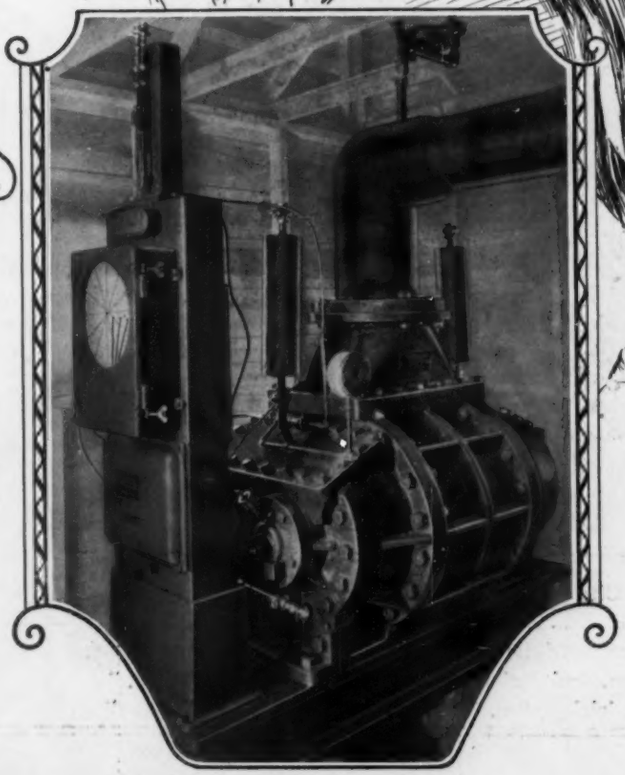

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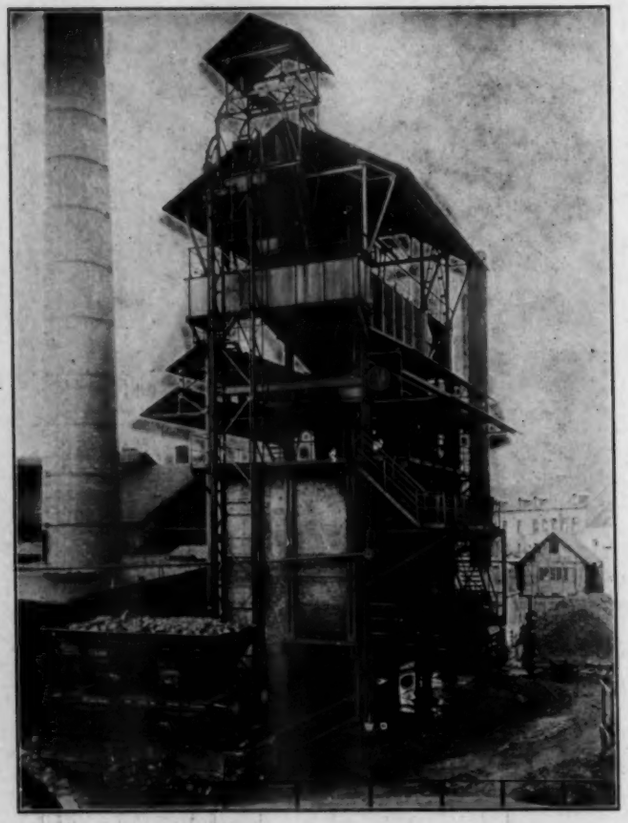
VERTICAL CHAMBER OVENS
With Water-sealed Drop Door
INTERMITTENT TYPE



Minimum Labor
Low First Cost

The annual operating reports of the Association of Swiss Gas Plants disclose that the "INDUGAS" ovens produce the largest yields of gas per ton of coal.

The following table shows the actual average yields from coal containing less volatile matter than the average American coal:

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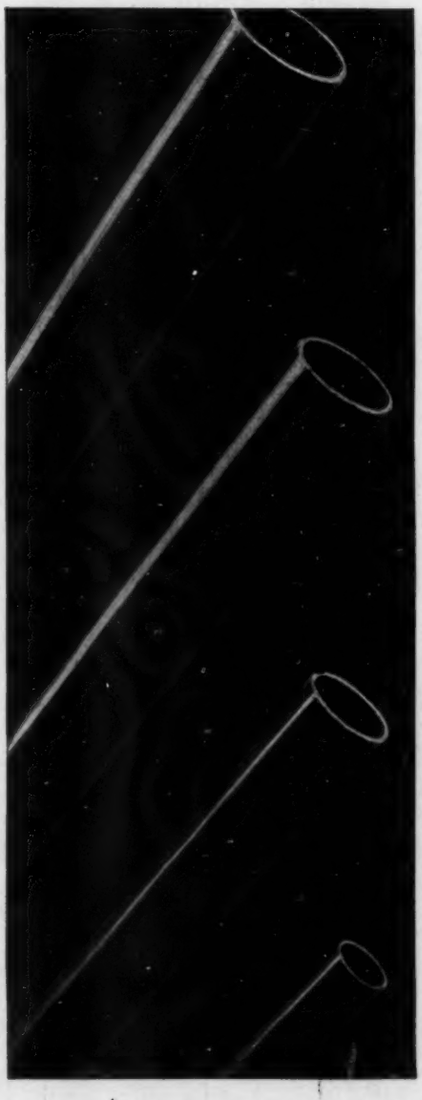
Baden, Switzerland	4 years average	14075	560
Olten, Switzerland	2 " "	13317	570
Friedrichshafen, Germany	4 " "	16045	515

There's a Reason

Full information, layouts and estimates gladly furnished

CARL STILL CORPORATION
114 LIBERTY STREET, NEW YORK

And Now
A. O. SMITH
MAKES ALL LINE PIPE *8" to 26"*



The A. O. Smith Corporation now makes line pipe in all diameters of 8 inches and over.

Uniform Wall Thickness

The SMITHWelding Process applied to steel of uniform thickness results in line pipe with uniform wall thickness throughout.

Uniform Roundness

Due to the Smith Method of Cold Forming, this pipe is accurately round at every point in its diameter and length.

Less Metal

This pipe is made in any thinness that you desire to specify. Its thickness can be accurately co-ordinated to any field conditions encountered.

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Due to the patented SMITHWelding Process, this pipe is produced with invariably 100% joint efficiency, thus eliminating any chance of leakage.

All Line Pipe Requirements above 8 inches

Smithsteel Line Pipe, SMITHWelded, is now available for any line requirement from 8" to 26" inclusive.

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SMITH *Welded* LINE PIPE

STURDY
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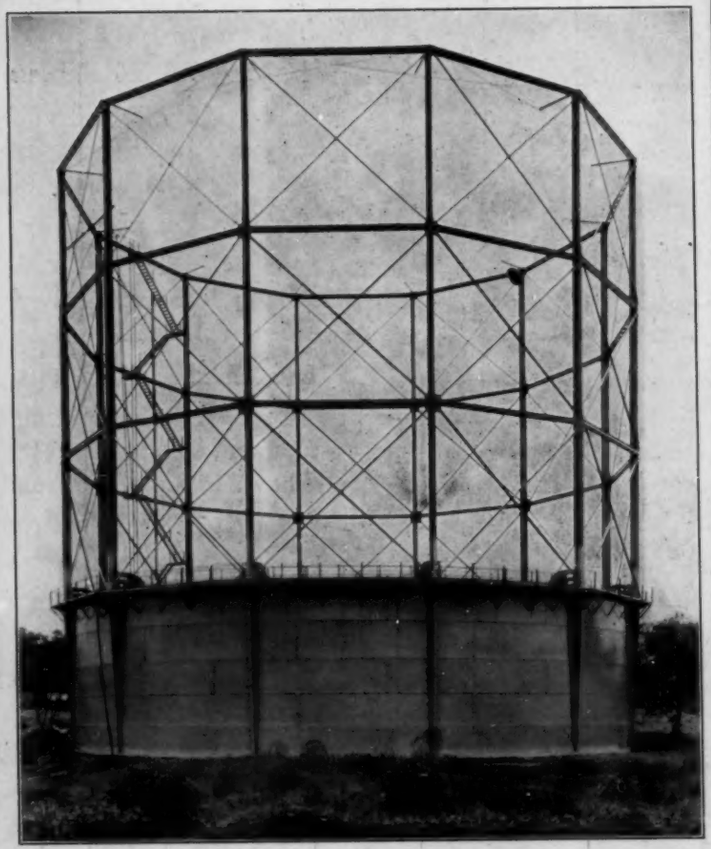

One Million Cubic Foot Gas Holder, for the Arlington Gas Light Co., Winchester, Mass.

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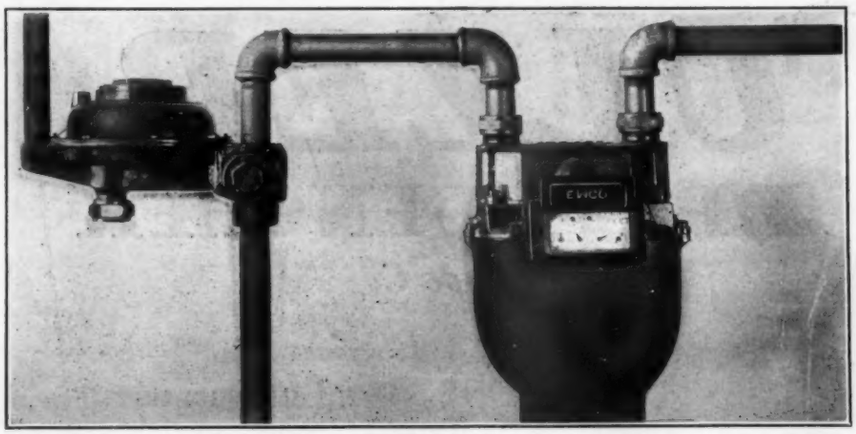

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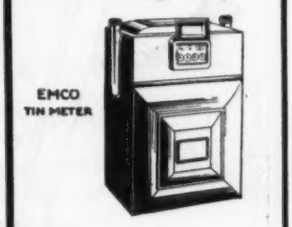
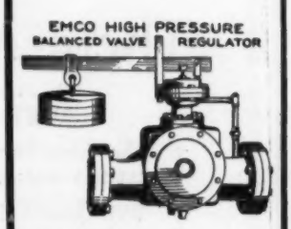
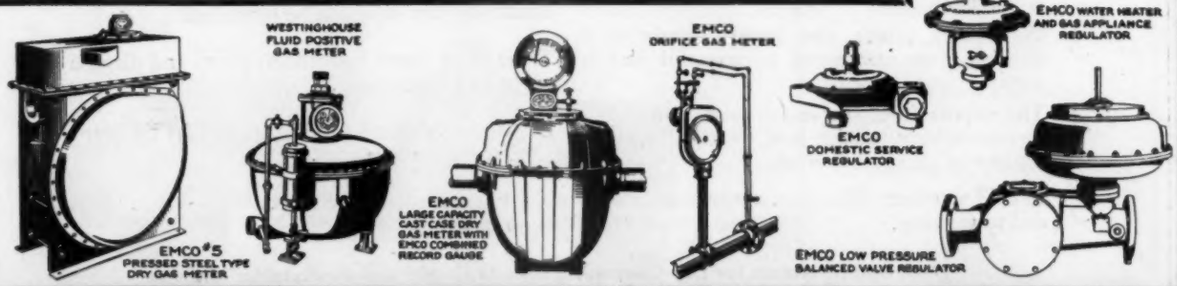
THE combination of the EMCO Service Regulator with the EMCO Cast Iron Meter is an important factor in eliminating the service troubles encountered in domestic installations and results in consumer satisfaction. Constant and unfluctuating pressure at the burners of appliances is assured by the regulator in spite of widely fluctuating line pressure or consumption.

Accurate measurement, in keeping with even pressure regulation, is secured by the EMCO Cast Iron Meter. EMCO ruggedness, accuracy and ease of service are essential factors to be considered.







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SULZER
DRY QUENCHER
Type C

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There Are Two Methods of Cooling Coke

	WET QUENCHING	DRY QUENCHING
1	The heat contained in the hot coke is entirely wasted.	The heat of the hot coke is reclaimed and utilized for steam generation.
2	Wet Quenched Coke contains a high and variable percentage of moisture, entailing increased fuel consumption when the coke is burned.	The percentage of moisture in Dry Quenched Coke is low, uniform and controllable, thus reducing fuel consumption. If desired, an absolutely dry coke can be produced.
3	In regions where the water supply is limited, wet quenching is wasteful and costly.	There is no water to furnish, pump and dispose of, in Dry Quenching.
4	The vapors from the steam arising in the wet quenching process lead to high maintenance of plant steel work.	Dry Quenching of Coke eliminates this plant steel work maintenance.
5	In cold weather, difficulties are encountered due to freezing.	No water used in Dry Quenching—hence there is no freezing.

THE Sulzer System for Dry Quenching coke is simple and dependable. In the Type C Dry Quencher the hot coke is put in a special coke car and this car is placed in a sealed quenching chamber. Inert gases are circulated in a closed cycle, by means of a fan, through the hot coke mass where they absorb the sensible heat of the hot coke and this heat is transferred to the water in the boiler circulation and converted into steam.

Dry Quenching Equipment Corporation

INTERNATIONAL COMBUSTION BUILDING

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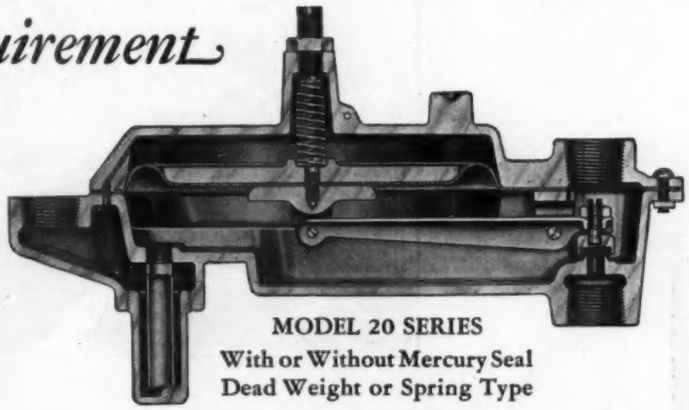
A SUBSIDIARY OF INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

(Reynolds)

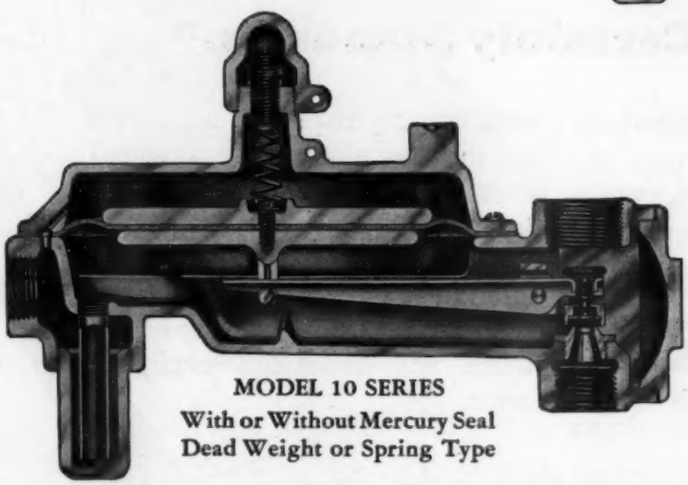
REYNOLDS REGULATORS

answer every requirement

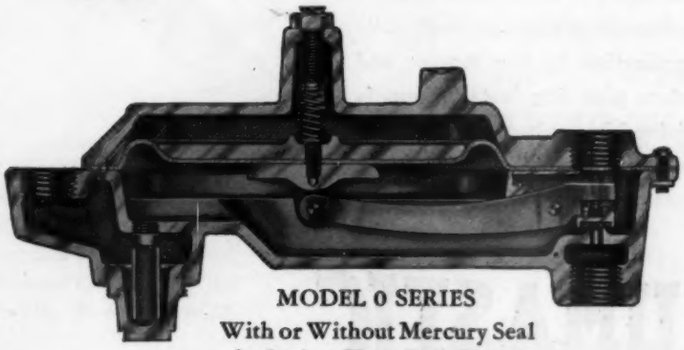
Adaptable **to all conditions and every individual plant requirement, REYNOLDS has solved all your service regulator needs with Model 0, 10 and 20 Series.**



MODEL 20 SERIES
With or Without Mercury Seal
Dead Weight or Spring Type



MODEL 10 SERIES
With or Without Mercury Seal
Dead Weight or Spring Type



MODEL 0 SERIES
With or Without Mercury Seal
in Spring Type Regulators

Reynolds Products

for all kinds of Pressure Reduction—for either artificial or natural gas.

Governors—
- Intermediate Pressure
- Triple Outlet
- Holder
- Toggle Type Street

Regulators—
- High Pressure Service
- Low Pressure Service
- Intermediate Pressure
- High Pressure Line
- Single and Double District Station

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Eastern Service Company, Boston, Mass. F. E. Newberry, Avon, N. J.
Thos. C. Corin, Detroit, Mich. Gillespie & Schwan, Inc., Dallas, Texas

RECOGNIZED LEADERSHIP IN GAS CONTROL SINCE 1892

"This Line Certainly Stands Up"

One hundred million dollars are lost annually through the corrosion of oil and gas lines. This loss, however, is being steadily reduced through the application of Bitumastic Enamel. Lines inspected long after laying show that the protection afforded by this long-lived coating requires no renewal and that the pipe itself is as sound as when received from the mill. Bitumastic Enamel, in consequence, is being used on the world's largest oil and gas lines and its record indicates that corrosion losses of the future will become a negligible factor.

The performance of Bitumastic Enamel for more than forty years, as well as its recent application to the largest and most modern pipe line installations, is fully explained in our book—"The Protection of Pipe Lines." Write for a complimentary copy.

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Wailes Dove-Hermiston Corporation
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ROOTS

In Conjunction with the

New Roots Meter

there is...

a complete line of new indicating and recording instruments designed to meet every demand for refinement, accuracy and convenience, both in station and industrial service. Write for details.

See the new Roots Meter, Model SA, with the instruments, at the A.G.A. Show, Atlantic City, October 8th to 12th. Booths 71 and 72.

The P.H.&F.M. ROOTS CO.

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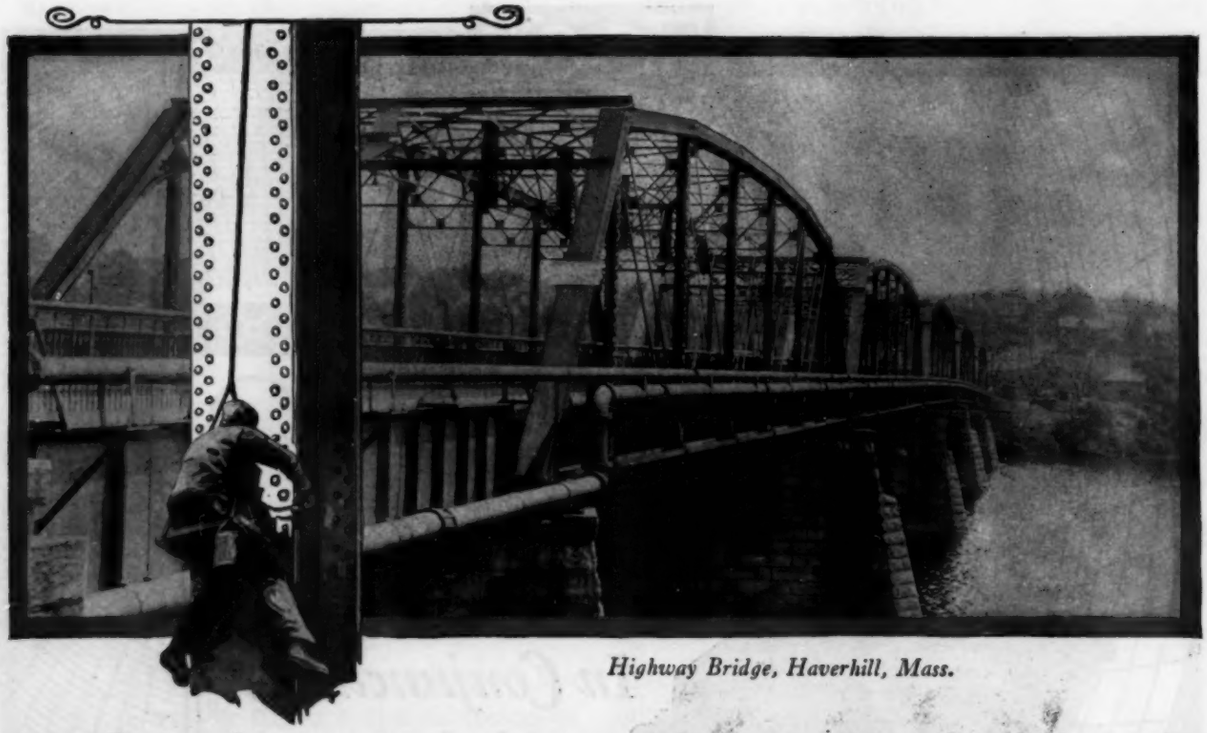
Peoples Gas Building

CONNERSVILLE, INDIANA

NEW YORK
120 Liberty Street

Originators of the Double Impeller Rotary Principle



Highway Bridge, Haverhill, Mass.

and, after 18 years they painted with Dixon's Silica-Graphite **Paint** *again*

A most emphatic endorsement of the long wearing qualities of this paint is to be found on Highway Bridge, Haverhill, Mass. Yankee farsightedness selected Dixon's Silica-Graphite Paint for this job 18 years ago, and in spite of extremes of temperature, moisture, weather and traffic conditions it was not until recently that this bridge was repainted. Even then, a large portion of the original paint job was found to be in perfect condition.

This is paint service! . . . This is Dixon!

But Highway Bridge is only one of scores of iron and steel structures throughout industry that have been adequately protected for an unusual number of years from rust, corrosion and process deterioration by the use of Dixon's Silica-Graphite Paint. This practical example has been duplicated, times without number, in your own industry—very likely right in your own territory. Write us for a list of plants where you can inspect Dixon's Silica-Graphite Paint films which have delivered 5 years' . . . 10 years' . . . and, even 20 years' . . . continuous protection.

Dixon's Primer

Dixon's Red Lead-Graphite Primer fills the needs of those who prefer a red lead paint for priming coats.

Dixon's Aluminum-Graphite Paint

This paint combines the advantages of aluminum and graphite as paint pigments. For use wherever a light colored paint is desired.

Dixon's Silica-Graphite Paint

Colors: Attractive appearance of the finished job by this paint's durable finish may be had by using any of the three tones of gray, dark red, green or black.

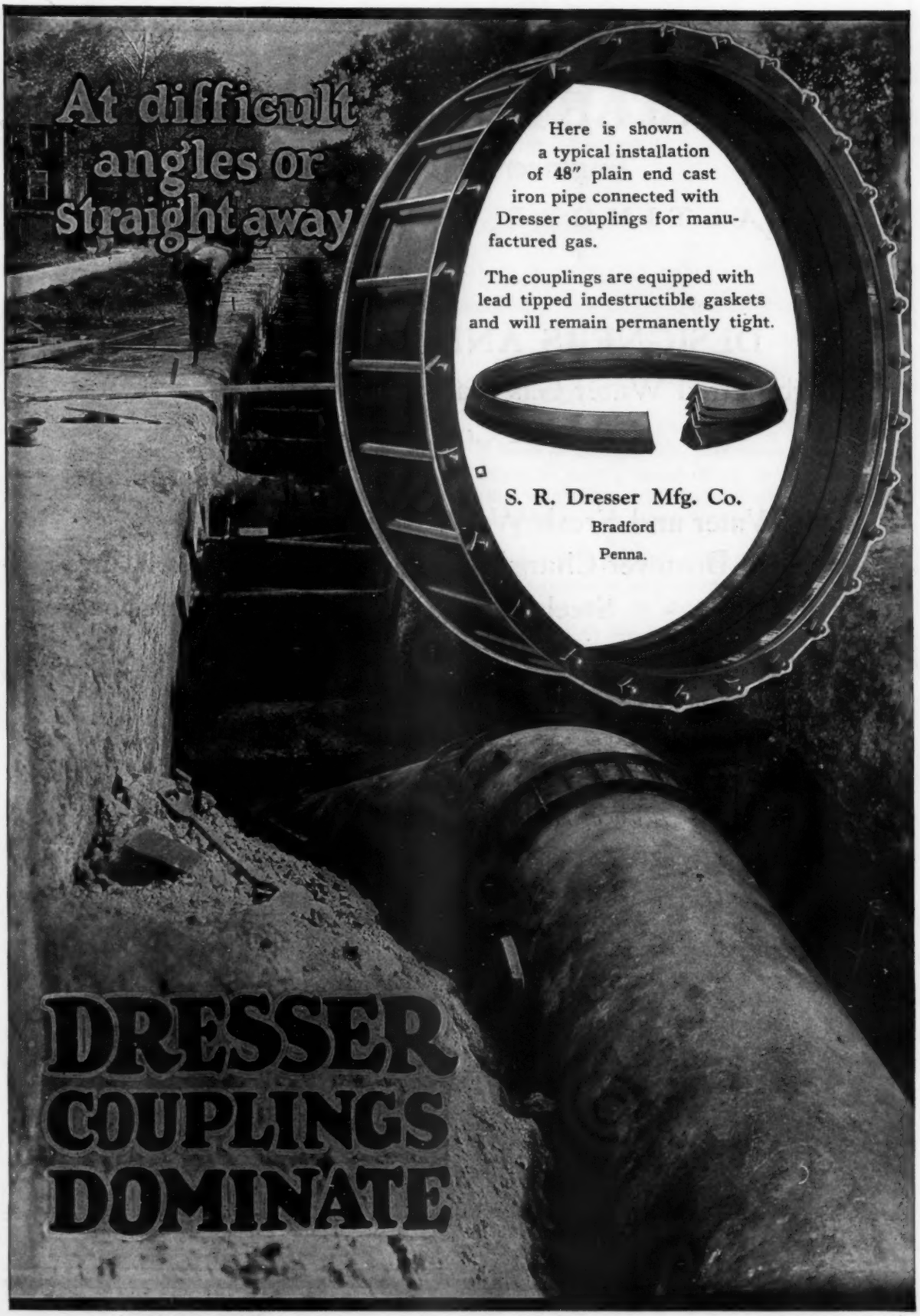
Get the full story of Dixon's Silica-Graphite Paint by sending today for Booklet No. 231B!

JOSEPH DIXON CRUCIBLE CO.
JERSEY CITY, N. J., U. S. A.
Established 1827

D X N TRADE MARK

DIXON'S SILICA GRAPHITE PAINT

Adequate Protection at Minimum Ultimate Cost


At difficult angles or straight away
Here is shown a typical installation of 48" plain end cast iron pipe connected with Dresser couplings for manufactured gas.
The couplings are equipped with lead tipped indestructible gaskets and will remain permanently tight.
S. R. Dresser Mfg. Co.
Bradford
Penna.
DRESSER COUPLINGS DOMINATE

The BARTLETT HAYWARD CO.

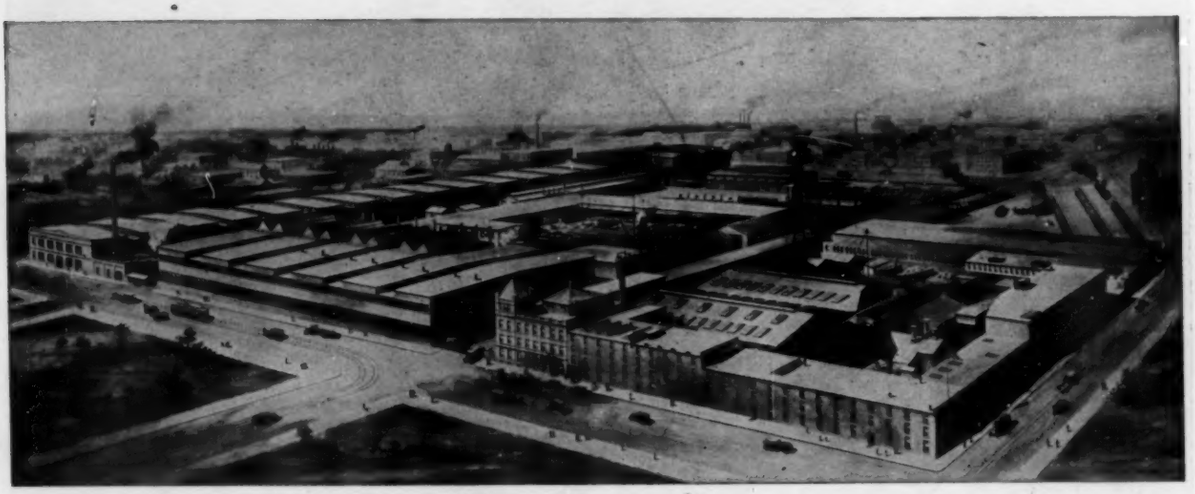
Engineers and Founders

BALTIMORE and NEW YORK

DESIGNERS AND BUILDERS OF:

Carburetted Water Gas Plants
Complete Coal Gas Plants
By-Products Plants
Salt Water and Fresh Water Condensers
De Brouwer Charging and Discharging Machines
Purifiers - Steel Tanks - Shaving Scrubbers
Vertical Waste Heat Boilers
Gas Holders

View of Main Plant, Located at Baltimore



AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900

HENRY M. RILEY, *Editor*

What Price Cooperation?

THERE HAS BEEN much discussion of the proposition of gas companies cooperating with and assisting the plumber and independent appliance dealers in the marketing of gas appliances and, in general, such teamwork would seem to be quite in order. However, before precipitating ourselves into such a situation, we should investigate carefully, to the end that we will be cognizant of any price we will have to pay and the magnitude of the bill.

Figuratively speaking, the industry stands ready to "foot" any reasonable bill in this connection but it might transpire that there will be one item in the reckoning that we cannot well consider swallowing.

IT IS REASONABLE to assume that the average receptive plumber or fitter can be schooled sufficiently, so that he can be depended upon to do a workmanlike and dependable job on our customer's premises. And, make no mistake, so long as a house boasts of a gas meter, the occupant will always be our customer and not the plumber's, even though we might entirely give up the sale and connection of appliances.

Further, the outside fitter can be advised of the safe and efficient utilization of our product, so that our fears can be minimized in this regard. Moreover, the financial mathematics of the matter are not very difficult of solution. So, even though there might be trifling lapses along these lines, they would not occasion any serious impairment of high service standards.

CAN WE GUARANTEE the personal deportment and courtesy of the outside fitter while on our customer's premises? Can we feel sure that the fitter will follow one of the most stringent and inflexible rules in the whole category of gas company procedure, namely, always being courteous and lacking in gossip?

It is not difficult to picture what would happen to the present high standard of good feeling between the gas industry as a whole and its customers in the event that a horde of discourteous plumbers and outside fitters were turned loose on the latter. We would come in for a season of withering criticism and our reputation for good service would topple like a house of cards, because our customer would indirectly consider the plumber or outside fitter as our agent.

If in cooperating with the plumber and dealer, we will have to stand for any damaging discourtesy on the part of the man making the installation, then the whole affair is not worth "a weevil in a biscuit," and might as well be forgotten. The price would be prohibitive.

Safe Equipment for Gaseous Atmosphere

A GREAT DEAL of work has been done on motors, switches, lights, and similar facilities for use in atmospheres that may at times contain explosive mixtures of dust or gas with air. More complete application of this type of equipment has been made in coal mining than in any other branch of American industry. Dust-proof and explosion-proof equipment is now provided for haulage, lighting, power drives of all types, and for a multitude of other underground operations.

Much of this development and many of these types of equipment are well suited to gas-plant use. There is no reason for maintaining in the purifier house, in the light-oil building, or elsewhere about the plant any electrical or mechanical facilities not properly safeguarded. In many such locations managements may say that there should be no gassy atmospheres, but all experienced managements know that with the fallable human element present there is always chance that through accident or carelessness there may be some such conditions temporarily set up.

It is a small matter to provide explosion-proof equipment in such locations as can by any chance become gassy. It is a precaution that will pay well as an insurance against fatal or financially serious accidents. It will be well worth while for every executive to have a careful survey made of all the operating properties under his direction to determine whether or not there exist some such locations not already amply safeguarded in this particular.

The very great importance of maintaining uninterrupted gas service will warrant extremes of precaution that no other industry might feel warranted in observing. The gas business has an enviable reputation for continuous service and nothing should stand in the way of maintaining this good name.

Heating the Isolated Office

THERE are in all communities many small outlying stores and offices where the installation and maintenance of a coal-fired heating plant introduces the problem of furnace tending to the embarrassment of the owner or occupant. Sales offices in new real estate developments and small shops maintained and operated only by ladies afford particularly good examples of cases where gas heating will be welcome. The slight extra cost is much more than offset by the certainty and convenience of service.

Any gas manager that is looking for additional business will do well to drive up and down the suburban streets which his company serves with gas, having this particular possibility in mind. Oftentimes an hour of motoring will disclose a dozen, or possibly even a hundred, good prospects for such gas heating service. Unless the seasonal load curve of the company would unduly suffer by adding such business it will be a very profitable thing to go after it during the late summer and fall months. Then with the coming of cold weather all will be ready for this new group of customers.

Expert Timing

WE ONCE KNEW of a store-keeper in a large Eastern city who prospered and thrived by merely using elementary gumption and timing his efforts to a nicety. This sagacious merchant must have had something of the old-time pack peddler in his make-up, for only let the first snow of winter gauge a scant inch in depth and he was driving his small "flivver" truck loaded with snow shovels from door to door in his immediate neighborhood. And, make no mistake, he sold snow shovels—to the chagrin of his competitors who sat in their stores waiting for customers to come in and buy of their own volition.

At other set intervals or seasons he went about with the "flivver" truck loaded with appropriate wares which found as ready a market as the snow shovels. This part-time hawker was an expert timer. He knew how to make a sales effort jibe with a certain event or a sudden change in weather.

We have often speculated as to what he would have done had he handled some kinds of gas appliances.

It is our idea that along in the latter part of September when there had been one chilly day or so he would have loaded the selfsame "flivver" truck with fire-place heaters and started to make his rounds of door bell ringing—and *selling*. We are further of the opinion that he would have known in advance which houses boasted regulation fire-places.

Then, too, we entertain a fleeting thought that after some such event as a pure food show or cooking demonstration or church supper, he would have fared forth with at least one gas range on his truck.

Although the gas company cannot be expected to cart its wares from door to door at every whipstich, it is felt, however, that it can broaden its efforts in timing the sales effort to keep step with the event. It can well continue to emulate the humble part-time peddler referred to.

Always
In Order

WE VENTURE the opinion that most gas companies would be super-content to create some such regular position as "Suggestion Handler" if their employees would only force them to this expedient by way of building up a continuous stream of suggestions.

The obstacle in the way of installing this regular position would seem to be a condition whereby potential suggesters are either those who think up ideas and are afraid to broach them, or the remainder who are eternally spouting suggestions which resolve themselves into worthless and destructive criticisms.

The timid souls are the ones that should be cultivated by the management, and, in a spirit of friendly cooperation. They should be encouraged and given to understand that one "bull's eye" is well worth the ninety-nine "duds" expended in getting the range.

Many times an employee will contend that he will get no credit even if he does put across an idea that is valuable. He should assure himself as to the accuracy of this assumption because there are innumerable companies that are yearning for the stripe of employee who is intelligently studying how to cut corners, even if ninety-nine out of a hundred of his suggestions do go wide of the mark.

In turn, gas companies should go on record as welcoming earnestly thought out suggestions, whether "dud" or "bell-ringer", and plan to the end that such ideas will be handled in an efficient manner.

In this issue, Mr. Streyckmans describes very clearly how his company makes a suggestion system work and, since suggestions are always in order, his article will doubtless give many executives a new and fresher "slant" on the matter.

Not
Far-fetched

IN THE NEWS SECTION of the current issue will be found an item having to do with the connection by pipe line of two towns in Indiana, and therein it is stated that "gas service may be extended to small communities and farms along the route."

It is a fact that many farms have gone in for enterprises on a large scale that require not a small amount of heat and power for their carrying on. The operation ot a dairy farm is an important example of such specialized activities. Then, too, it was brought out during the last Natural Gas Convention in Dallas that the drying of alfalfa by gas might be worth investigating. Also, the Baltimore company is successfully heating a farm house with gas a good many miles from the center of town.

Of course the problem of supplying the farm with gas depends upon the revenue obtained as weighed against the cost of running the mains and services for distributing the gas.

Since farms are getting increasingly into closer proximity to towns and cities where gas service exists, it is highly likely that the Commercial and Utilization Departments of not a few gas companies will detail some one person to make a survey of these potential customers in the farming districts.

The average farmer has long since metamorphosed from the "hayseed" condition and is quite up to the city folks in demanding the latest and best that is available, both as regards his personal comfort and his working conditions.

Lay Your
Plans Now

ATTENDING A CIRCUS and endeavoring to take-in all five rings at one sitting is no more disconcerting than going to the annual A. G. A. Convention without a semblance, at least, of a schedule of what one wants to see and accomplish while there.

Besides furnishing the latest and best thought along all lines of gas company procedure the A. G. A. Convention constitutes a clearing house for many questions and problems that never reach the convention floor or meeting room. Here one may meet a brother-in-the-craft from a thousand miles off and indulge in a mutually profitable comparison of various methods for doing a piece of work.

Now is the time to start jotting down memos of certain gas men you desire to have a confidential chat with; of wrinkles you want some information about; of the section you want to concentrate on; of some particular manufacturer you desire to question.

If you delay such organization of your thoughts and ideas you will most assuredly not reap a full measure of benefit from the Convention.

Plan to Attend the A·G·A·Convention

CARRYING ON THE WORK OF THE PORTLAND, OREGON, GAS AND COKE COMPANY, WHERE THE PREMIUM SYSTEM HAS ADDED TO EMPLOYEE MORALE AND INCENTIVE

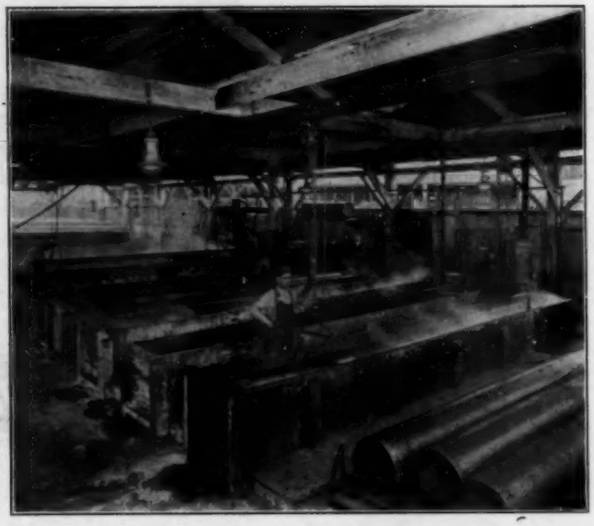
Upper right—Delivery of briquets in residence district in winter.

Center right—Excavating trench for large transmission main.

Bottom right—Coating large steel main pipe.

Bottom left—Meter repair men at work, showing trucks for handling meters and hoods for removal of fumes.

Below—Gas makers at controls of oil gas generators.



An Outline of the Premium Systems of the Portland Gas and Coke Company

AS early as the year 1915, the first step was taken toward establishing some method of awarding employees for their individual effort to increase the efficiency of operation and to decrease costs.

In establishing the standards of the various activities hereinafter described, many local ideas were worked out and each plan being considered by itself, there resulted a wide variety of methods of payment of premium.

Although well-known wage payment systems such as the Taylor, Gantt, Halsey, Rowan and Emerson were studied, at that time no attempt was made to follow the methods of any of them. As a matter of fact, however, a number of the plans worked out did follow the Halsey plan.

Survey Points Way

As the result of a survey made in 1924, it was felt that the time had come when all systems should be brought to operate along much the same line and after considering the results secured by the several well-known systems, a decision was made to revise all existing plans to conform to the Halsey 1-3 plan. This required some adjustments of base rates and standards; however, no reduction of earnings was attempted on the whole. Changes were made to spread the premium out more evenly over the various groups of employees than had been the case. Incidentally all future premium plans that may be put into operation will follow this plan.

The new standards under this revision are as follows:

With the gas makers there are several conditions that determine the premium. Gas makers are not in control of all the conditions surrounding their work, but can control those for which premium is paid. These are:

Carbon in Generator. If the generator is free of carbon deposit each day, a premium is paid. If the generator is only 80% free of carbon the premium is reduced proportionately.

Quality of the Gas. The Company is required to deliver gas to the city having an average heat value of 570 B. t. u. Premium is paid each day if the gas falls within 20 B. t. u. either way of this figure the premium increasing as the performance approaches 570.

Premium is also paid on the number of runs each generator makes each day without smoking. This is for the purpose of preventing the plant from becoming a nuisance to the part of the city in which it is located.

The power house engineers are paid premium on their performance on five points of rating:

Operation of Compressors
Lubrication
Collection of hourly data
Cleanliness
Holder heights

The power house firemen are paid premium for boiler efficiency of over 75% and for cleanliness.

Briquetting and Miscellaneous

The making of oxide is a one man job now whereas formerly seven men were required. Mechanical improvements have accounted for disposing of four of these men and the adoption of premium payments has eliminated two of the other three. The standard is 37 cubic feet mixed per man hour.

On removing old brick and putting new brick in the generators the standards are 30 brick removed per man per hour and 45 brick put in per man per hour.

On emptying and filling purifiers the standards are 30 cubic feet of oxide removed per man per hour and 67 cubic feet put in per man per hour.

On unloading materials the standards are, .65 of a ton of lime per man per hour, 1 ton of copperas per man per hour, and 150 brick per man per hour.

On briquet manufacture this company has four filters, four dryers and two briquet presses, together with the necessary conveyors to assure progression of the material. From 20 to 25 men are involved and the standard production established on this work is 3.00 tons of briquets per man per day of 8 hours. Premium is paid for each ton manufactured in excess of this figure.

On briquet delivery the standards are:

2	trucks	and	6	men	.....	19	tons	or	48 units
2	"	"	5	"	.....	16	"	"	40 "
1	"	"	3	"	.....	11	"	"	24 "
1	"	"	2	"	.....	8	"	"	16 "

For resacking briquets 1 ton=3 units. In all of these cases a unit is a man hour.

Repairing briquet sacks is a one man job and is done with an electrically driven sewing machine. The standard is 104 sacks repaired in 8 hours.

Distribution Department

On main and service work the standard unit is one man hour. On services a definite number of units is assigned to each kind. For performance of the work in less time, premium is paid. On mains a definite number of linear feet of main installed is considered one unit. If more feet than standard are installed, then premium is paid. The standards are:

Install, Remove or Lower	*Linear Feet=1 unit*
1" H.P. mains under 500' in length	6.0
1" " " over 500' " "	6.5
2" " " under 500' " "	5.0
2" " " over 500' " "	5.5
2" L.P. "	2.2
3" " "	2.2
4" C.I. "	1.5
4" L.P. "	1.8
4" H.P. "	2.2
6" L.P. "	1.1
10" " "	0.6
Replace	
1" H.P. main	4.5
2" " "	3.5
2" L.P. "	1.8
3" " "	1.8
4" " "	1.4
6" " "	0.8

Service Installation	*Units per Service*
¾" in city and vicinity	
Truck and motorcycle	13
On foot	14
¾" in Oregon City, Gresham, Troutdale & Vancouver, Washington.	
Truck and motorcycle	14
On foot	15
¾" Service with main extension	11
1¼" regular	16
Truck and motorcycle	15
On foot	16
1¼" Service with main extension	13
1½" Service	17½
2" Service	
Tap main or extend curb	17½
Cut in tee	24
Curb service	4½
Remove or Lower	
¾" service	7
1¼" service	4½
Replace	
¾"or 1¼" service less than 20' in length	6½

Main Installation	
On macadam streets	80% of regular standard
Under hard surface	60% of regular standard plus credit for cuts.

Hard Surface Cuts (Hand)	*Units*
Concrete or Asphalt cut 1½' by 3'	3.3
Bitulithic cut 1½' by 3'	2.7
Permanent repairs (concrete) 1½' by 3'	1.7

Hard Surface Cuts (Air Tools)	*Sq. Ft. Equivalent to 1 Unit*
Concrete pavement	13
Asphalt including base	14
Bitulithic	18
Bar Holes	
Dirt streets	7 holes=1 unit
Macadam	3½ " =1 "
Hard surface	3 " =1 "
Sidewalk	
Cut	1 flag=1.7 units
Repair	1 " =1. "

Replace Gaskets	*Units*
¾" joint	3.3
4" "	4.5
6" "	5.5
10" "	13.
12" "	13.

Install Emergency Clamps	*Units*
Small sizes	3.3
16" on dirt streets	13.
" Macadam	16.5
Recalk	
4" C.I joint	3.3
6" " "	4.5
10" " "	9
16" " "	13

Tighten	
1" Screw coupling	2.2
2" " "	2.2
2" Dresser "	2.2
4" " "	3.3
6" " "	4.5
Install	
Clamp & saddle over leak	3.3
Dresser Coupling	4.5
Curb box and cover	3.3
Drip drum on service	4.5
Curb cock	4.5
Emergency Clamp	3.3
Cut off and abandon service	3.3
Cut off and remove service	6.5
Cut off and extend ¾" service (up to 35 feet)	5.5
Cut off and extend 1¼" service (up to 25 feet)	5.5
Eliminate trap in service	10.0
Repair broken service	9.0
Flush or clear service	3.3
Reconnect service to main	3.3
Tighten clamp and saddle	3.3
Replace drip riser	3.3
Change location of curb cock	5.
Raise gate box	4.
Replace gate box	5.5
Repair pavement around gate box	4.5
Pump drip on emergency call	2.2
Repack 4" valve	3.3
Replace	
¾" H. P. cock	4.5
Curb box	3.3
Street ell	3.3
Street frame and cover	3.3
Lamp post	18.
Remove lamp post	7.5

Large Mains	
Remove macadam	15 cu. ft.=1 unit
Hand excavation (sand)	40 " " =1 "
" " (clay)	30 " " =1 "
Machine excavation (4 men)	135 " " =1 "
" " backfill	135 " " =1 "
Bracing	70 bd. ft.=1 "

Laying pipe 30" or 24"	
Lining for welder	35 lin. ft.=1 unit
Lower in ditch (hand)	9 " " =1 "
" " " (crane)	35 " " =1 "
Lining in ditch	13 " " =1 "
Bell holes—30"	1 hole =4.5 "
" " —24"	1 " =4. "
Test " —30"	1 " =2.2 "
" " —24"	1 " =2. "
Grading ditch—30" (Sand)	27 lin. ft.=1 unit
" " —30" (Clay)	18 " " =1 "
" " —24" (Sand)	30 " " =1 "
" " —24" (Clay)	20 " " =1 "
Tunnel Filling—30" (Sand)	1 lin.ft.=0.25 unit
" " —30" (Clay)	1 " " =0.55 "
" " —24" (Sand)	1 " " =0.2 "
" " —24" (Clay)	1 " " =0.5 "
Tunnel Braces	1 set=1.4 "
Remove Bracing	100 bd.ft.=1. "
Tunnels 30" sand (hand)	1 lin.ft.=0.45 unit
" 30" clay (hand)	1 " " =1.0 "
" 24" sand (hand)	1 " " =0.1 "
" 24" clay (hand)	1 " " =0.8 "
" machine, ½ credit for hand work.	
Load excess (hand)	1 cu. yard=0.8 unit
" " (crane)	25 " =1.0 "
Hand backfill (sand)	80 cu. ft. =1.0 "
" " (clay)	60 " =1.0 "
Shovelling back (sand)	80 " =1.0 "
" " (clay)	60 " =1.0 "
Testing joints 30" line	5.5 joints=1.0 unit
" " 24" line	6.5 " =1.0 "
Coating joints 30" line	1 " =1.0 "
" " 24" line	1.3 " =1.0 "

Miscellaneous Work	
Lanterns	1 lantern=1.0 unit
Clean up	300 ft. ditch=1.0 "
Water boy	150 men—8 hrs.=8.0 "

Holder Maintenance

Painting	*Amount Equivalent to one unit*
Crown, side sheets and tank (hand)	80 sq. ft.
Crown, side sheets and tank (air brush)	160 "
Cups, first coat	40 "
Cups, second or third coat	50 "
Struts and guide columns (hand)	30 "
Struts and guide columns (air brush)	60 "
Spot painting	25 "
Scraping struts and guide columns	3.5 "
Scraping and spotting crowns and sheets	5.0 "
Chipping rust in cups	6.0 lin. ft.

Arc Light Maintenance

On the maintenance of arc lights the trimmers are paid premium on the basis of the number of nozzles, as the number of nozzles varies with the size of light. The standard is 3000 nozzles per month per man. Premium is paid for all nozzles trimmed in excess of this. In addition, if any trimmer keeps the material used in his work below 18 units, he receives additional premium, one globe counting as twelve units and each mantle as one unit.

Meter Repair Work

On meter repair the work is broken up into several parts, one man doing each part. Standard production on each is:

	Meters per hour
Adjusting	4.5
Top work	1.35
Cleaning and packing	3.0
Casing up	2.0
Testing old meters	6.5
Testing new meters	10.0
Tops off only	10.0
Put in diaphragm	1.0
Remove diaphragm	2.0
Remove tops and back plates	4.5
Remove cases	3.7
Topping	12.0
Gassing	10.0
Badging	25.0
Painting	16.0
Tinning	30.0

In the above standards a 3 or 5 or 10 light meter is called 1 meter, 20, 30, 45 and 60 light meters are called 2 meters, 100 light meters are called 4 meters, and 200 light meters are called 5 meters.

Meter and Appliance Installation

The work of fitters on installation of meters and appliances is divided into three parts called Measure, Cut and Install. This is for the reason that generally a different man does each part. The meter standards are as follows:

Size	*Class of Order*	*Measure* Min.	*Cut & Assemble.* Min.	*Install.* Hrs.	Min.
3 to 10 light	E. R. set		8		60
	65-A set				40
	Change, with truck				27
	Change with motorcycle				40
	Removal, with truck				12
	Removal, with motorcycle				20
20 to 60 light	E. R. set	20	13	2	0
	65-A set			1	20
	Change, with truck				40
	Change, with motorcycle			1	20
	Removal, with truck				27
	Removal, with motorcycle				40
Over 60 light	E. R. set	20	20	4	0
	65-A set			2	40
	Change, with truck			1	20
	Change, with motorcycle			2	0
	Removal, with truck				40
	Removal, with motorcycle			1	20

The governor standards are as follows:

Size	*Class of Order*	*Install.* Min.
All sizes, set with truck		3
	Set with motorcycle	12
	Change	40
	Removal	15

Below are tabulated the appliance standards.

Class of Order	*Measure* Min.	*Cut & Assemble* Min.	*Instal* Hrs.	Min.
Ranges	20	24	4	0
Kitchen heaters	30	15	4	0
Kitchen heaters with coils	30	30	5	30
Tank heater	30	30	5	30
Auto heater	1 hr. 30	1 hr. 0	13	0
Storage heater	2 hr. 0	1 hr. 0	21	0
Washing machines	30	30	1	30
Radiantfires	30	30	4	40

The furnaces installed are manufactured by the company and are made in several types or sizes, as sheet metal, 8 section, etc. The work of installing is also broken up into parts, namely: measure, cut, assemble, install, and inspect. Standard times have been determined for each part. Premium is paid for completion of the work in less than standard time. Separate standards have been set up for installations where it is necessary to remove an existing heating plant and for installation where no removal is necessary.

On construction of furnaces the standard times for completion are:

	Hours
8 section furnace	29
16 section furnace	29
Single unit sheet steel furnace	43
Double unit sheet steel furnace	62

On Gasco floor heaters the standard times for completion are:

	Hours
In lots of 6 or less	27
In lots of 12 or less	25
In lots of 24 or less	24

For double 8 and double 16 section furnaces, the standard is double that of the single 8 and single 16 sections.

Furnace Vent Pipes and Fittings

On manufacture of vent pipes and fittings for furnaces, the standard production per man is:

Size	*Fittings*	*Kind*	*Pieces per Hour*
3" & 4"	Vent	Copper	9
5" &6"	"	"	8
7" & 8"	"	"	7
3" & 4"	"	Black	20
5", 6", 7" & 8"	"	"	16
3" & 4"	Ells 45° & 90°	Copper	3.5
5" & 6"	" " "	"	2.5
7" & 8"	" " "	"	2
3", 4", 5", 6" & 7"	" " "	Black	4
6"x4"	Ells	Heel & top outlet	1.5
6"x4"	"	Rt. & Lt.	1.0
No. 20	"	Radiantfire Spl.	3.5
No. 35	"	"	2.0
3" & 4"	Tee	Black	2.5
4"x3" & 6"x3"	"	"	2.5
6"x4" & 6"x5"	"	"	2.5
4"x3"x4"	" taper	Copper	.75
5"x5"	"	"	.75
3"x4"	Taper	Black	8
5"x4"	"	"	5
6"x4" & 7"x6"	"	"	4

Size	Fittings	Kind	Pieces per Hour
No. 16-311	Taper	Black	9
6"x3", 6"x4"&6"x5"	Reducers	"	3.5
5"x4" & 7"x6"	" Oval	"	1.5
3", 4", 5" & 6"	Straps & Hangers	Copper	12
3", 4", 5" & 6"	" " "	Black	20
5", 6", 7" & 8"	" " "	Galvanized	11
3" & 4"	Draft Hood	Copper	1
5" & 6"	" "	"	.75
7" & 8"	" "	"	.50
3" & 4"	Thimbles	Galvanized	16.
5" & 6"	"	"	15.
7" & 8"	"	"	12.
5"x6", 6"x6", 6"x8"	Y Branches		.6

Pipe Coating

On coating pipe the standard man hours per 100 linear feet of pipe coated are:

Pipe Size	Man Hours
¾"	.464
1"	.472
1¼"	.718
2"	1.172
3½"	1.561
4"	2.140
6"	3.107
10"	6.225
12"	7.360
16"	9.846
20"	14.615
22"	14.615
24"	14.615

Cost Comparisons

A comparison of unit costs for 18 of the more important operations previous to the establishment of premiums and the 1924 unit costs show a general reduction and on the accompanying table we are showing the work, the date the premium started, what cost was compared and the percent change in cost in each case:

Work	Date Started	Cost	Percent Change in Cost
Briquet Mfg.	4-1-1918	Labor per ton	—48.7
" Delivery	4-1-1918	Total per ton	—21.1
Arc Trimmers	4-1-1918	Total per arc per month	+78.4
Gas Makers	9-1-1918	Labor per 1000 cu. ft. of gas	0.0
Power House Engrs.	9-1-1919	Labor per 1000 cu. ft. of gas	—26.3
Power House Fir'n.	9-1-1919	Labor per 1000 cu. ft. of gas	—26.7
Meter Repair	9-1-1919	Total per meter	—28.4
Fitters	10-1-1919	Total per meter & governor instal.	+2.2
Furnace Instl'n.	10-1-1919	Total on 16 section furnace	—47.9
Mains and Serv.	11-1-1919	Labor per ft. of ¾" H.P. service	—22.5
		" " 1¼" H.P. service	—27.7
	Revised	" " 2" L.P. main	—12.9
		" " 4" " "	—13.1
	5-15 1923	" " 6" " "	—27.3
		" " 1" H.P. "	—48.1
		" " 2" " "	—19.5
		" " 4" " "	—25.7
Furnace Const.	2-1-1920	Total on 16 section furnace	—21.5
Making Oxide	3-1-1920	Labor per cubic foot	—29.4
Rem. Gen. Brick	3-1-1920	Labor per 1000 brick	—50.5
Bricking Gen.	3-1-1920	Labor per 1000 brick	—46.3
Empty Purifiers	3-1-1920	Labor per cubic foot of oxide	—36.4
Fill Purifiers	3-1-1920	Labor per cubic foot of oxide	—38.5
Repairing sacks	4-1-1920	Labor per 100 sacks	—29.9
Pipe Coating	11-1-1920	Labor per foot per inch diameter	— 0.4

It will be noted that in the case of gas makers, there was no change in cost either way. In two cases the cost showed higher; on trimming arc lights and on installing of governors and meters. In neither case is this due to payment of premiums. The arc trimmers in 1924 were covering about the same territory as in 1918, but the number of arcs in service has dropped to about one-third of the number in service in 1918, and each light in 1924 was being serviced about twice as often, hence the cost figure in 1924 covered less lights with about twice the amount of work per light. It is apparent from this that the 1924 cost might easily have been double that of 1918, but greater efficiency of the men has held it down to a 78% increase.

On installation of meters and governors by fitters, the 1919 figures of record did not cover all of this work done, as a change in accounting later showed, and as a result more time was, in 1924, charged to this work per installation than in 1919. How much higher this has made the 1924 figure cannot be exactly determined, hence we must show a slight increase in this case.

On coating of pipe the figures showed only a slight decrease. This is in the face of adding a considerable amount of work to this operation in order to get our present satisfactory coating. All other operations show a marked decrease.

Financial Benefits

In order to get an idea of the actual financial benefit the saving made on the 1924 business has been calculated for five of the more important activities, namely: briquet manufacture, briquet delivery, power house labor, main and services, and meter repair and in round numbers this amounted to $112,000.00.

Our survey reveals that our base rates have not been increased in this period up to the normal rate we should have to pay if we had not had the premium to supplement the base wage.

Normal rates for the vicinity would have added approximately $41,000.00 to the payroll, which is a saving actually made through having premium payments in operation. Adding this to the above $112,000.00 we have then a total saving of $153,000.00 on the 1924 business.

The total premium payroll in the Operating Department for 1924 was, in round numbers, $73,000.00.

Deducting this from the total saving, we still have a saving of $80,000.00 after premiums have been paid. From this also must be deducted the additional cost of operating the premium systems. This has been calculated at approximately $10,000.00, which, when deducted from the $80,000.00 leaves a net saving to the company of $70,000.00.

This seems a very clear-cut proof that the premium systems in operation have given results that were fair alike to both employer and employee as after the expense of operation has been met, the balance of the saving has been divided almost equally between the men and the company as will be seen by comparing the employees' share, as represented by the premium payroll, and the figure of net saving to the company.

General Results

Aside from the purely financial standpoint as indicated in this paper thus far, there are other benefits, not exactly measurable in money perhaps, but desirable nevertheless, that have arisen from the operation of premium plans. First is: From the restless dissatisfied tendency of labor as a whole during the war period has come a highly efficient, loyal, self-respecting group of employees; self-respecting because the operation of premiums has virtually placed each employee more or less in control of his earnings. Many employees are now working with little supervision and yet are doing their work promptly and correctly. This condition would be impossible if the good-will of the employee had not been won.

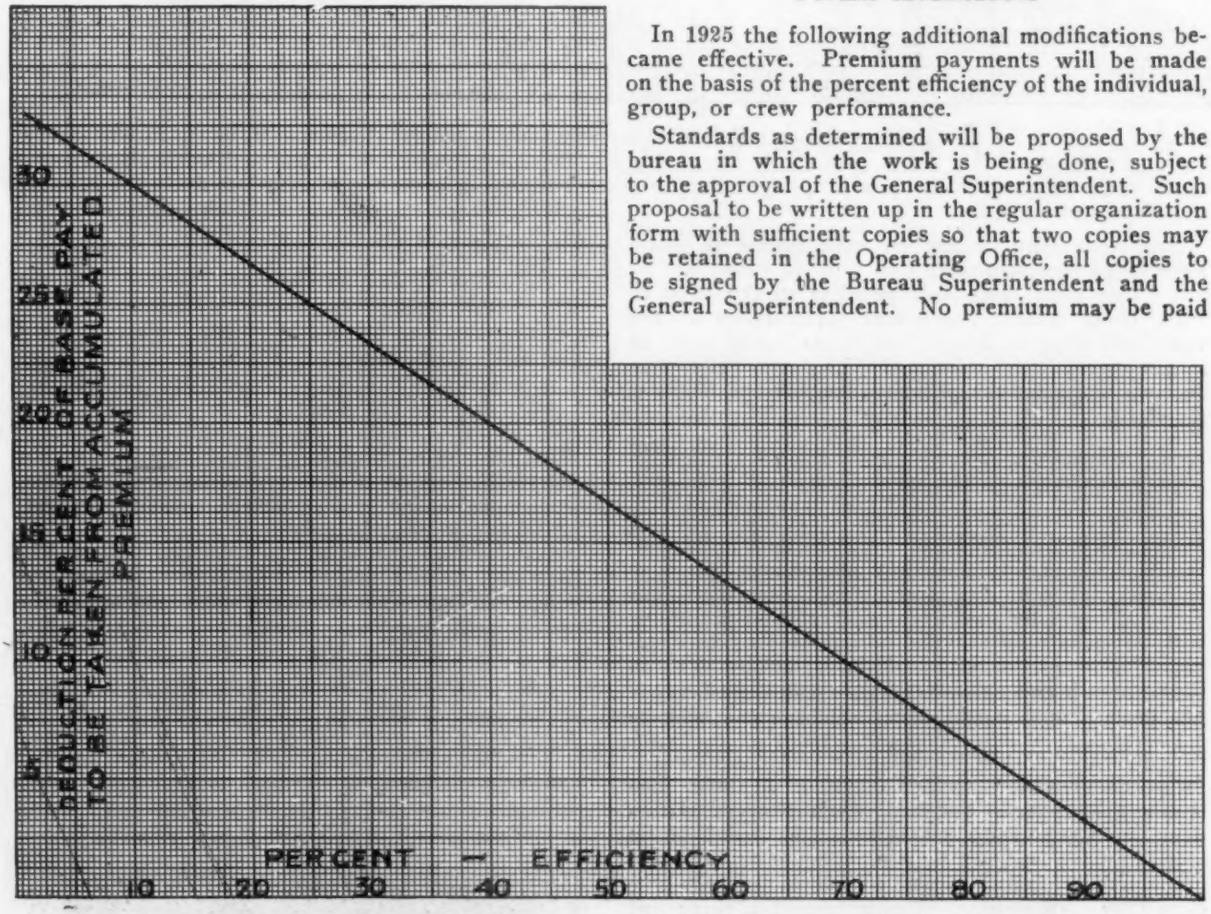
Along with the improvement in the spirit of the men has come a steadiness. Some operations especially at the gas plant, and the street work by their nature formerly caused many employees to leave after only short terms of employment, but many of these operations which formerly required a complete replacement in personnel every few weeks, now go for weeks without a replacement and terms of employment of two and three years are the rule rather than the outstanding exception.

The nature of this company's business has always required careful inspection of the work done and inspectors have been used long before any premium system were established. This inspection system has been found satisfactory and sufficient in keeping the quality of work done under premium systems up to the required standard. It has not been found necessary to go to any additional inspection expense since placing the work on premium basis.

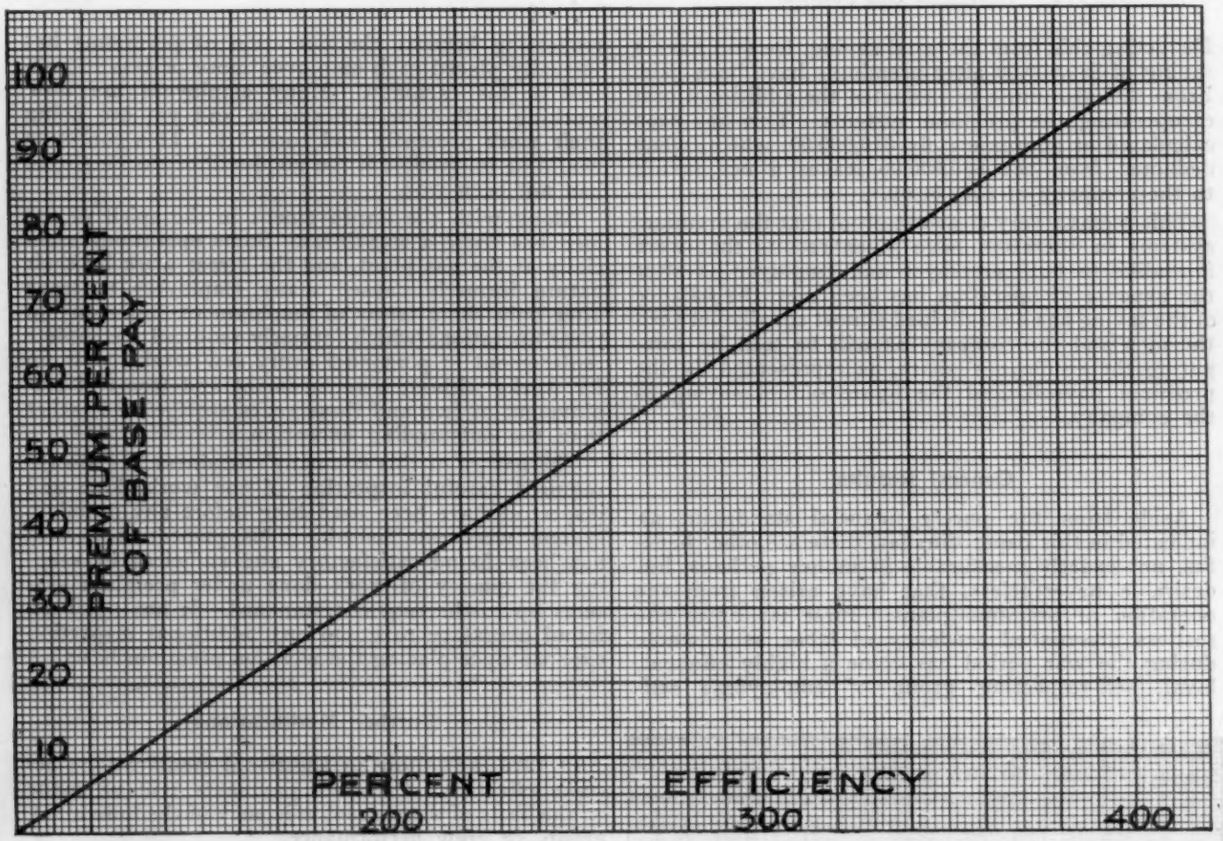
Further Modifications

In 1925 the following additional modifications became effective. Premium payments will be made on the basis of the percent efficiency of the individual, group, or crew performance.

Standards as determined will be proposed by the bureau in which the work is being done, subject to the approval of the General Superintendent. Such proposal to be written up in the regular organization form with sufficient copies so that two copies may be retained in the Operating Office, all copies to be signed by the Bureau Superintendent and the General Superintendent. No premium may be paid



Uniform schedule of premium deductions based on per cent efficiency for performance of less than 100 per cent



Uniform schedule of premium payments based on per cent efficency

until such proposal has been properly submitted, approved and signed.

Standards may be set on man hours of work, number of pieces, quantity in tons or cubic feet or any other reasonable unit peculiar to the type of work being done. The actual performance on the work will then be determined in the same units as that set forth in the standard. The percent efficiency then will be actual performance divided by the standard.

Premium will then be calculated for each man as indicated herewith in curve form showing the percent of his base pay to be paid for each percent efficiency. Pemium will begin at 101% efficiency. If the efficiency falls below 100 there is a percent of the base pay for each percent efficiency which is to be deducted from the accumulated premium. All premiums will be paid once a month and premiums will be calculated for the period on accumulative basis. If no premium has been earned by the end of the month and on some of the work the efficiency has been less than 100, the deduction will be cancelled and must not be made from the base pay. In case any worker has worked overtime he will be paid the usual time and a half or whatever rate is now paid as far as the base rate is involved. However, in figuring his efficiency, the actual hours worked must be used in comparing with standard hours if hours are the bases of determining the efficiency for performance. An illustration of this point is as follows:

Presuming a man whose rate is $6.40 for 8 hours actually works 10 hours and thereby receives credit for an extra hour, he would actually be paid 11 times his hourly rate or $8.80, but when calculating the premium, the percent of the base rate for 10 hours without considering overtime or the correct percent of $8.80. Suppose his efficiency has been calculated to be 175%, the premium percent then would be by the attached tables 25%. The premium then would be 25% of $8.00 or $2.00 and not 25% of $8.80, which would be $2.20.

This method of procedure must be used for establishing all standards and premium payments whether the proposal is for a new operation or for the revision of one already in existence.

If, at any time, any operation upon which standards have been set that in any way affect the performance, as, by changing the character of the work which might require fewer men or more men by the introduction of machinery or any labor-saving device, new proposals must be prepared, showing proper standards for the new conditions within the succeeding premium period unless causes for delaying such establishment are approved by the General Superintendent.

Plan to Attend the A.G.A. Convention

A regular meeting of the Peoples Gas Light & Coke Company Suggestion Committee. From left to right: J. E. Davies, General Manager, Peoples Gas Stores; T. V. Purcell, Vice President in charge of Sales; A. L. Tossell, Secretary and Assistant Treasurer; W. A. Sauer, Vice President in charge of Accounts; A. Honnegar, Business Research Corporation, Chicago; A. H. Thorn, Manager, Industrial Relations; B. J. Mullaney, Vice President in charge of Public and Industrial Relations and Chairman of the Committee; W. O. Hodgdon, Secretary, Suggestion Committee; J. M. Roberts, Superintendent, Customers Order Department; W. G. Rudd, Vice President in charge of Operation; H. E. Heil, Assistant Superintendent, Distribution Department. George F. Mitchell, Vice President in charge of Finance is not in the picture.

Making a Suggestion System WORK

By Felix B. Streyckmans

The Peoples Gas Light and Coke Company, Chicago.

THE mere statement, "Suggestions are welcome", can be classed with such expressions as "Keep Off the Grass", "No Admittance", and "Come up to the house sometime"—they don't mean anything; nobody pays any attention to them.

Suggestions from employees of The Peoples Gas Light and Coke Company on improving routines and service are welcomed by the company and are received in great numbers. But the management believes that the welcoming would be only a gesture were the company not making a business of encouraging, receiving, analyzing and rewarding suggestions.

The suggestion system was inaugurated by presidential order; is supervised by a committee of the five vice-presidents and five of their assistants; is administered by a full-time secretary and an assistant; and the committee has full and final power to determine policies and extent of awards.

During four years of operation, 5,000 suggestions have been submitted, 1,000 of which were paid for. Over $7,000 in cash has been awarded suggestors. The money cost has been a demonstrably good investment and the company is benefiting further from ideas submitted, the tangibility of which cannot be audited. While these results are not sensational, they do represent an advance and they invite further liberalization rather than restriction of the Suggestion System.

Prior to the inception of the present organized and systematically conducted suggestion system, employees were invited to contribute their ideas for improving any phase of the company's methods but adequate handling of them was not provided for. Many other elements of completeness which constitute the present system were lacking.

Suggestions came in then at the rate of only about 200 a year.

Here are some features of the present suggestion system—a system which has brought a 500 per cent increase in employee-participation, has stimulated alertness and interest of employees in their work and has been a financially satisfactory business operation:

Acceptable suggestions are rewarded in proportion to their worth—their benefit or value to the company—without consideration of any other factor. Obviously then, there is no maximum amount of award. One employee recently was awarded $850 for an idea which simplified a phase of billing; another, who suggested a joint form, replacing two previously used, to effect a saving in stationery and improve the work of the clerks, was given $90; another suggested substituting Dresser couplers for flange unions on large meter installations, service and drip repairs and installations and was awarded $375. There are many instances of awards exceeding $100.

Types of Awards

There are three types of awards: Letters of appreciation for those not acceptable which state the reasons for the impracticability of the suggestion and encourage further participation in the suggestion system; merit marks, having a cash value of fifty cents each for suggestions which have merit and show unusually intelligent thought, although there may be some reason why the suggestion cannot be put into effect; and cash awards for suggestions which are used.

When the suggestor has accumulated ten merit marks, having a value of $5, they may be cashed.

There is no maximum on the number of merit marks given for one suggestion—as many as ten and twenty have been awarded for meritorious suggestions which could not be utilized. Thus good suggestions may receive five or ten dollar awards in spite of the fact that they cannot be put into effect.

Acceptable suggestions are paid for in cash as soon as it has been decided to adopt them. But when a suggestion promises economy, the awards are not considered final. When such a suggestion has been in effect a reasonable length of time, the auditing department computes the annual savings and an additional award is given when the audit shows that the savings exceed the original estimate. In fact, even a letter award is not final—the suggestion is kept on file and if any future change in routine or any other alteration in company practice surrounding the circumstances of the suggestion make the idea available, the suggestion is rewarded.

The suggestion cited previously where an award of $850 was given is an example of how this practice of keeping suggestions open to further consideration works out. The suggestor recommended that, in posting cash, the coupons should remain in the current and final files until the balance is found correct each month. A new system of simplified bookkeeping had just been inaugurated and was in its experimental stage. Although not very familiar with the routine of the new system, the members of the reviewing committee felt that the suggestion would not be practical. A letter award was made—a letter of appreciation. A few months later difficulty developed in the system and the suggestor's idea was tried. It was shown to be an improvement and he was immediately awarded $150. Later an audit was made which showed that the elimination of details was much greater than had been anticipated. He was given a supplemental award of $700.

Subjects of Cash Award Suggestions since the last report:

No. 13232—Submits design for change of location of Main Building standpipe, to eliminate accidents—$5.00 award.

No. 13330—Plan to have all L. C. L. inbound shipments coming over certain listed railroads, relayed to Infreight House, No. 6, to reduce costs—$10.00 award.

No. 11737—Revised routine where meter is transferred use of Form 317 by Bookkeeper—$5.00 award.

No. 12301—Submits substitute for Form 459, Memorandum Coupon, for more effective results—$5.00 award.

No. 11749—When arc lamp removes are issued by the Collection Department, and itemized bill should be attached, to aid salesman in adjusting details with the customer—$5.00 award.

No. 11728—In addition to information now listed by meter book file clerks on Cut Off final orders sent to Billing Division, List also the consumption, to aid month-end balances—$5.00 award.

No. 12487—All meter leased to other concerns or individuals be painted a distinguishing color—$5.00 award.

No. 13715—Suggests correction of company's name on Cafeteria cashier's check—$5.00 award.

No. 12494—Suggests change of title, as well as other revisions, in Form M-14—$5.00 award.

No. 11060—Suggests certain improvements on the gas range of the A. B. Stove Company—$15.00 award.

Following the dinner meeting in February, at which $1525.00 in supplemental cash awards were distributed, there has been a flood of suggestions, and March promises to be one of the biggest months. Here's a suggestion from the Secretary: *Look for the big things. They pay!*

Merit Marks

12438	2	10289	9
8629	3	10407	5
13326	3	11734	5
12464	3	13765	10

Letter Awards

4691, 10216, 10219, 10227, 10408, 11027, 11133, 11162, 11446, 11447, 11840, 11856, 11995, 12303, 12422, 12423, 12457, 12458, 12491, 13176, 13477, 13581, 13582, 13662, 13718, 13728, 13892, 13976, 15111, 15140, 15414, 15599.

*Duplicate Suggestions—10309, 12311, 12575, 13636, 13595, 13640, 15541.

A constant reminder of the money to be earned by offering suggestions is given in this Suggestion System publicity appearing in the Peoples Gas Club news, the semi-monthly employee magazine-newspaper.

Additional Checks

At the last presentation of supplemental awards in March, six suggestors, who had originally been given a total of $230, received additional checks totaling $1,525.

Maintaining an honest and constant effort to give suggestions the utmost consideration, as the supplemental awards indicate, fosters active interest of a very large number of employees in the suggestion system and keeps that interest from lagging, even though some suggestions receive only letter awards.

Early in 1926 an employee suggested that all meters—and there are over 895,000 of them set now—be read from the central office by means of electrical signaling devices, eliminating meter readers and the necessity for availability to customers' premises. His suggestion was accompanied by drawings—working plans—for such a system.

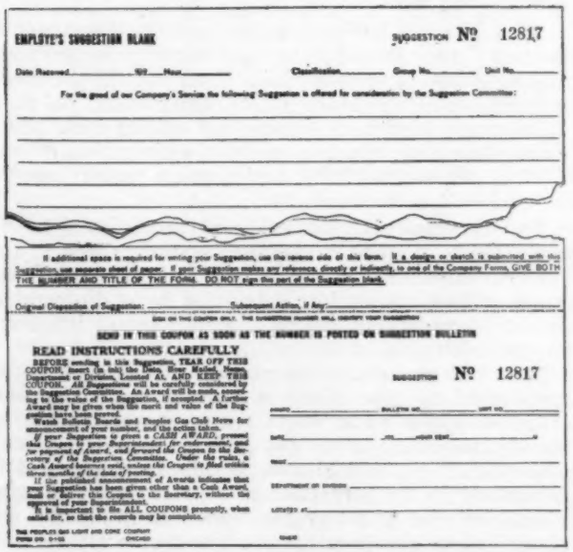
A reviewing committee comprising competent engineers was delegated to go over his plans. It was found that his system was entirely practicable—that by means of the attachment to meters that he had devised, and the method of plugging in on a wallboard which would contain a separate contact reaching each meter, the current reading would be indicated. An obstacle to adoption of his suggestion, of course, was the prohibitive cost of laying wires from the central office to each of over 800,000 meters throughout the city.

Although the suggestion could not be put into effect, the suggestor was given a cash award for his effort, but his suggestion and drawings remain on file. He is hoping that radio development may make his system workable by permitting the substitution of radio impulses for electrical impulses by wire and he still has a deep interest in his suggestion although

it was submitted two years ago.

Permitting suggestions to be submitted anonymously is another factor which contributes materially to the success of this system—from the standpoints both of encouraging suggestions and assuring equal consideration and disposition of all of them.

Suggestion blanks may be secured from boxes placed conspicuously and conveniently in every department throughout the company. Each blank has a coupon which is detached and retained by the employee, the blank and coupon being numbered. The author is not known until the award is made public through posting by number on bulletin boards. The author of the suggestion then sends his coupon containing the corresponding number together with his name and department to the Secretary of the suggestion committee



EMPLOYE'S SUGGESTION BLANK SUGGESTION Nº 12817

Date Received ..... 192 ..... Hour ..... Classification ..... Group No. ..... Unit No. .....

For the good of our Company's Service the following Suggestion is offered for consideration by the Suggestion Committee:

If additional space is required for writing your Suggestion, use the reverse side of this form. If a design or sketch is submitted with the Suggestion, use separate sheet of paper. If your Suggestion makes any reference, directly or indirectly, to one of the Company Forms, GIVE BOTH THE NUMBER AND TITLE OF THE FORM. DO NOT sign this part of the Suggestion blank.

Original Disposition of Suggestion: ..... Subsequent Action, if Any: .....

USE ON THIS COUPON ONLY. THE SUGGESTION NUMBER WILL IDENTIFY YOUR SUGGESTION

SEND IN THIS COUPON AS SOON AS THE NUMBER IS POSTED ON SUGGESTION BULLETIN

READ INSTRUCTIONS CAREFULLY

BEFORE sending in this Suggestion, TEAR OFF THIS COUPON, insert in into the Date, Hour, Maker, Group, Department or Division, Location AT AND KEEP THIS COUPON. All Suggestions will be carefully considered by the Suggestion Committee. An Award will be made, proportioning to the value of the Suggestion, if accepted. A further Award may be given when the merit and value of the Suggestion have been proved.

Watch Bulletin Boards and Peoples Gas Club News for announcement of your number, and the action taken.

If your Suggestion is given a CASH AWARD, present this Coupon by your Superintendent for endorsement, and for approval of Award, and forward the Coupon to the Secretary of the Suggestion Committee. Under this rules, a Cash Award becomes void, unless the Coupon is filed within three months of the date of posting.

If the published announcement of Awards indicates that your Suggestion has been given other than a Cash Award, mail or deliver this Coupon to the Secretary, without the approval of your Superintendent.

It is important to file ALL COUPONS promptly, when mailed list, so that the records may be complete.

SUGGESTION Nº 12817

NAME ..... BULLETIN NO. ..... UNIT NO. .....

DATE ..... AM ..... HOUR ENDS .....

HOUR .....

DEPARTMENT OR DIVISION .....

LOCATED AT .....

THE PEOPLES GAS LIGHT AND COKE COMPANY

FORM 201 5-1-28 CHICAGO

Blank for submitting suggestions

Here is a panorama of the organization and routing of suggestions that constitute the "business" of properly considering them:

The suggestion committee functions through five Vice-Presidential groups representing the five major classes of company responsibilities. The suggestions are received by the secretary of the committee who classifies them appropriately and assigns them for investigation. Those which recommend methods for increasing sales are put into the group under the vice-president in charge of sales, and so on.

When Suggestions Accumulate

When twenty-five suggestions are accumulated, they are assigned respectively to the proper group representatives for examination. The suggestion committee itself does not do the actual examining, but each Vice-President delegates it, on the suggestions assigned to him, to assistants who are in each case closest to the work affected by the suggestion.

These reviewing sub-committees may consist of any number, depending upon the importance of the recommended idea and the complexity of its effect. Any employee is subject to appointment on a reviewing sub-committee, regardless of his position, although those holding the higher positions are most desirable. If a suggestor were to recommend the issuance of a certain type of handbook for new employees, this would concern the public and industrial relations vice-presidential group and the reviewers probably would be the manager of Industrial Relations, the superintendent of Training and Education, the superintendent of Employment, and some one from the Advertising Department who understands printed matter.

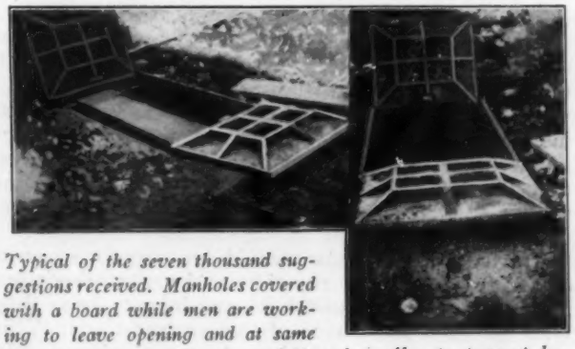
The committee Secretary sends the suggestions to the reviewers thus designated, asking each for his careful individual opinion on the merits of the suggestion together with such recommendations as his judgment dictates.

The reports of these reviewers are sent individually to the secretary as they are completed, re-assembled and sent back to the group representatives. From the opinions of the reviewing sub-committee, plus their own knowledge and experience, the group representatives decide the worth and practicability of the suggestion.

Committee Meets Regularly

The entire suggestion committee, consisting of the five groups, meets at regular intervals at the call of the secretary to determine awards based on the group recommendations. The awards having been determined, the secretary publishes a bulletin listing the suggestions acted upon, designating them by number and given the award. The authors then submit their coupons to the secretary.

From their receipt, suggestions are given the maximum of individual attention and thought. A hundred of them may be submitted this week but John Jones is interested only in the one he thought of. He has recommended the rejuvenation of used carbon paper by heating it slightly, thus fusing the remaining coating and thereby giving the surface the same even texture, free from uncoated spots, that it had when it was new. He has submitted with his suggestion samples of used carbon paper which he has heated and pressed on a flat surface for ten minutes at a temperature of 90 degrees centigrade. They look as good as new.



Typical of the seven thousand suggestions received. Manholes covered with a board while men are working to leave opening and at same time prevent passersby from falling in. Also to prevent dropping manhole cover into hole when replacing it if there should be a slip.

The suggestor evidently has put a great deal of thought and effort into his recommendation. Not

only that, he has himself actually gone through the process he suggests with pieces of used carbon paper to test its practicability before submitting the suggestion.

It would be decidedly unfair not to put the same amount of thought and effort into weighing his suggestion. It would not be conducive to encouraging future suggestions from the author if the idea were dismissed without telling him why.

Therefore, if the suggestion is not adopted and merely merit marks given for constructive thinking, the secretary will be able to tell the suggestor, from the report, that:

The Testing Department had heated used sheets of carbon paper as he recommended. The appearance of them, after heating, was the same as new paper but closer analysis showed that the surface was streaked—that the carbon had not flowed evenly and no method could be devised for controlling the flow.

Typists had used this rejuvenated paper and were dissatisfied with the appearance it gave their work. Although all of the impressions were legible, some were light and some were dark and parts of letters showed stronger than others.

With this knowledge that the management has gone through thorough attempts to make his suggestion work and has failed, giving the reasons, and being awarded five merit marks for his interest and thought, the author is encouraged to continue making suggestions.

Details of the System

These are just the broad fundamentals—the basic principles of the system—around which a mass of necessary details are worked out. Some of the details, which unite the broader factors into a well knit program, are these:

Suggestions are not placed in boxes to be collected periodically in batches; they are mailed or delivered directly to the office of the full-time secretary. As soon as they are delivered, they are stamped with the day and hour of their receipt to determine priority in the event of duplicate suggestions. Occasionally there is an epidemic of suggestions along one line and only the first of the type is considered, the others being classified as duplicates.

Comprehensive filing systems and forms are necessary to keep a running account of suggestions which may be in the hands of the secretary, the dittoing division, the group representatives, the individual members of reviewing committees or the main suggestion committee. There is a cross index card system which permits prompt tracing of all suggestions and is of special value in checking duplicate suggestions.

The secretary is always able to report progress on any suggestion at any time and those submitting them are invited to consult him as frequently as they wish to learn the status of their suggestions. This may be done over the telephone by mentioning merely the coupon number of the suggestion.

Awards are made with appropriate ceremony by the representative of the vice-presidential group benefiting from the suggestion. Payment is made in cash—with crisp new bills. And as the money is being handed over to him, the employee is thanked, in behalf of the company, for having submitted his suggestion. The management expects no thanks from the employee—although it is invariably given—for the award that is being made, but regards the transaction as one of indebtedness on the part of the company to the employee—just a small detail in the big "business" of assuring employees that suggestions ARE welcomed.

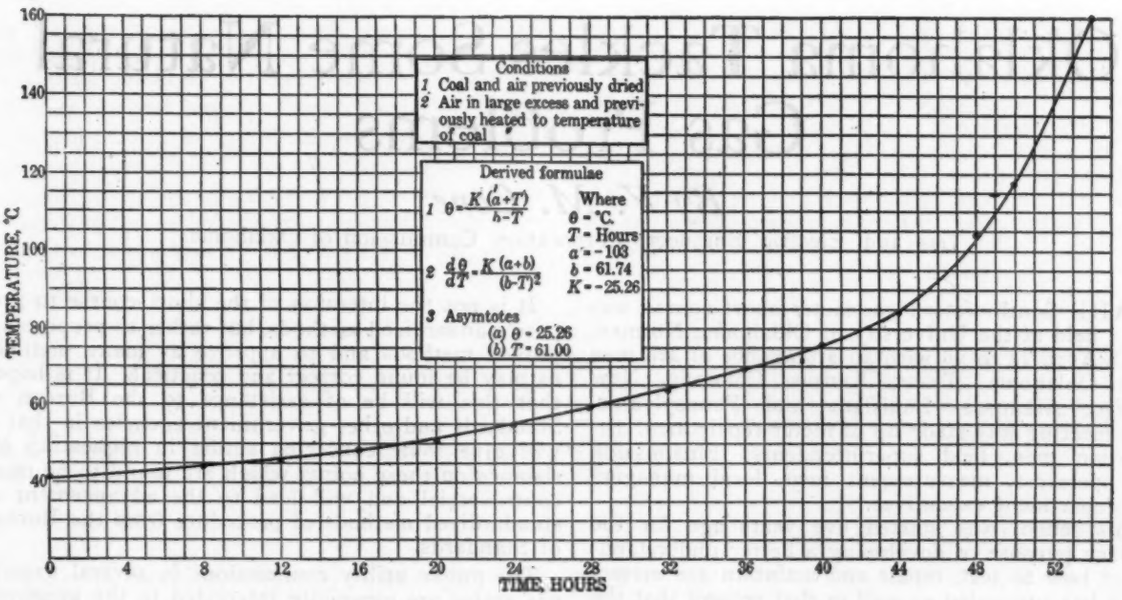
SPONTANEOUS HEATING OF COAL

AN EXCELLENT review of the literature and present knowledge on the causes and control of spontaneous heating of coal has been presented in Technical Paper 409 of the Bureau of Mines, by J. D. Davis and D. A. Reynolds. These authors summarize their investigations in the following language:

"1. All coals but anthracites undergo spontaneous heating; the liability to self-heating is greatest among coals of lowest rank. One should therefore use greater care in storing a subbituminous coal than in storing a high-rank bituminous coking coal. More pains should be taken to prevent segregation of fine coal in the storage pile, and foreign matter should be excluded more carefully.

"2. Oxidation of the coal substance itself is the main cause of spontaneous combustion; some of the organic constituents may contribute more to the heating than others, but it has not been shown that any one constituent exerts a preponderant influence to the exclusion of the rest.

"3. The process of spontaneous heating may be considered to take place in two stages. The first stage is operative at room temperature as soon as freshly broken coal is exposed to the air. It begins with the physical absorption of oxygen and is continued by the formation of a solid chemical compound of coal and oxygen, which is gradually decomposed as the temperature rises. Decomposition is not complete, however, until the temperature reaches about 445 degrees F. This first stage of the process generates heat, but not as much as the second stage. The coal increases in weight by the amount of oxygen retained. The second stage involves the breaking up of the solid compound of coal with oxygen and the formation of the final oxidation products—carbon dioxide, carbon monoxide, and water. With the Appalachian coals this stage begins to be appreciable at about 85 degrees F. and increases in intensity as the temperature rises. With lower-rank coals the beginning temperature is lower. Both stages of the process go on simultaneously, therefore, from about 85 degrees to 445 degrees F. There is no sharp transition from one stage to the other; the curve showing the relation between duration of heating and temperature is continuous. The rate of heating increases logarithmically with the temperature; that is, no coal has as an inherent property a critical temperature at which there is a sharp transition from relatively slow to rapid heating. When the term "critical temperature" is used, it should be clearly defined as the temperature at which the rate of generation of heat becomes greater than its rate of dissipation under certain fixed conditions. For other conditions the temperature will be different. For example, in a storage pile the heat-



Adiabatic heating rate of 100-mesh Pittsburgh coal, according to Davis and Byrne

ing usually starts in fine coal at a point about 6 feet from the surface. If combustion ultimately develops at this point, one may regard the temperature of the coal when placed in storage as its critical temperature in so far as critical temperature is determined by conditions that prevail at this particular point. At any other point where conditions (fineness of coal, rate of air supply, etc.) are different the critical temperatures of different coals are compared as a measure of relative ease of oxidation are valid only when the test conditions are strictly comparative.

"4. Pyrite when finely divided can increase the tendency of a coal to heat spontaneously. Although it has been shown that coals containing virtually no pyrite have fired spontaneously, it has also been quite definitely shown that fine pyrite when present in the coal does increase the rate of oxidation. One would not, therefore, select for storage a coal containing fine pyrite.

"5. Opinions differ as to what effect moisture in coal has on spontaneous heating. Probably the effect of moisture is determined by the conditions of storage. If one could be sure of wetting only those parts of the storage pile where spontaneous heating would otherwise develop, he could very probably prevent it; the heat required to vaporize the water would be more than the oxidizing coal could supply. However, wetting down the surface of the whole pile changes the conditions of ventilation and may favor heating at points not reached by the water, where dangerous heating would not otherwise occur.

"6. Chemical factors other than those touched upon in paragraphs 1 to 5 above have little or no influence on the spontaneous heating of coal.

"7. Laboratory studies have indicated what kinds of coal heat the most readily, and their relative tendencies to heat can be measured by several methods. The effect of fine coal, pyrites, etc., has also been shown. The fact remains, however, that all bituminous coals have heated in storage when conditions were favorable. It is believed, therefore, that the most fruitful studies of the future will deal with storage conditions. Work is particularly needed on the effect of air supply. For example, how should coal be stored to make sure that all parts of the storage pile will lack just enough air to support oxidation?"

CONTAGIOUS PROSPERITY

The idea that consumption is limited and that, therefore, only a definite amount of business can be done was consigned to the limbo of obsolete theories by Owen D. Young, in his address before the Chamber of Commerce of the United States.

"The notion that there is only a certain amount of business in the world to be done," he said, "and that international business is only a contest to see who can get the most of it is as false and unsound and disintegrating as the notion that there is only so much work in the world to be done and that the only way for workers to be prosperous is to do as little as they can in order not to exhaust the supply.

"We too frequently hear the statement that the production facilities of the world are in excess of its consuming capacity and that is the reason why we have to fight one another to the point of destruction in the field of international business.

"I have no patience with such notions. It is absurd to say that the human beings of this world cannot consume all they can produce. The trouble with the situation is not the lack of consuming power: it is one of cooperation to enable that consuming power to take and use the things produced. It is a mal-adjustment of our economic and financial machinery which permits wheat to rot on farms in some places while people starve in others."

Oklahoma Tackles Some Natural Gas Problems

By V. M. Cone

Gas and Electric Engineer, Corporation Commission of Oklahoma.

THE Southwestern gas-meter short course was held at the University of Oklahoma, Norman, April 24 to 26 with an attendance of 325 men from Oklahoma, Texas, Kansas, Colorado, New Mexico, Arkansas, Louisiana and Pennsylvania. This meeting was made up of meter repair men, distribution men, field superintendents, transmission line operators, measurement men, local managers and department executives.

This school was started five years ago for the primary purpose of developing a better understanding of how to test, repair and maintain gas meters and it has succeeded so well in that respect that the measurement phase of the gas business has outrun our knowledge and practice of other branches of gas transmission and distribution. It has also acted as a distinct spur to the manufacturers of meters and has resulted in a decidedly improved lot of equipment. Some of the field men realized the meager amount of information available on gas subjects, in general and they thought it would be well to expand the short course to meet some of our future needs.

Data Needed on Many Subjects

A committee of some eight or nine representatives of some of the largest gas companies in the Southwest was named to head this work. It is proposed that they head many minor committees for collecting the information available and encourage the development of additional data on such subjects as open-flow well testing methods, orifice measurement, meter proving, gravity determination, pressure basis, pipe-line flows, pressure-control methods and other needed considerations. There is too little printed information in general for the gas men and even that is not collected on any one subject so as to be readily available. If these committees get sufficient data to warrant a report, it is proposed that progress reports be made and when it seems that any subject has been fairly well covered that a report be made to the next session of the short course.

It is a peculiar fact that there are practically no standard methods for performing many operations connected with the gas business. Even such a simple thing as testing and proving domestic gas meters is performed in a variety of ways. Some drive the gas through the meter from the prover at a definite pressure, while others counterweight the prover and draw the gas through the meter into the prover. The point is that there may be several methods that will result in equal accuracy, but if such is the fact it should be known and approval be given to satisfactory methods.

It is not the intention of the short course to propose standardized methods, but rather to propose approved methods and to approve as many methods as may be found correct and practical. It is hoped that this will be of assistance to the Bureau of Standards and other government agencies in that it will give some concerted action in requesting assistance on these points which are found to be most controversial and will lead to the advancement of standardized methods of procedure from the Bureau of Standards.

The public utility commissions in several natural gas states are especially interested in the approved method work; and we in Oklahoma are fostering it, because it will be of material benefit in connection with rate hearings where opposed interests often submit data obtained by different methods and seldom are they therefore directly comparable. Usually it is impossible to throw out statements because of improper or inaccurate methods having been used.

The natural gas industry is largely a stepchild of the oil business. The incidental or accidental development of a gas supply when drilling for oil, led to the laying of a simple pipe line to a nearby market and the gas was sold at a flat rate. As the demand increased or the supply decreased the pipe lines were extended, and this mushroom growth reached such proportions that the owner found himself in a major business with a considerable investment. Gas acquired a distinct value as a competitive fuel as soon as a dependable supply was assured for any locality, and a new utility requiring regulation was "utility minded"; and, indeed, it is a rarity today to find a natural gas man who considers his consumers as an integral part of his business.

Problems Are Numerous

As the natural gas business assumed larger proportions, our problems began to multiply. Just a few years ago there was such a complacent ignorance among gas men that they had no gas problems. Scarcity of gas, higher prices, longer and larger pipe lines, high well pressures, pressure booster stations, introduction of different gases from several localities into a single pipe line system, utilization of tail gases from natural gasoline plants, development of more efficient gas burning equipment which requires better pressure control, and various other factors in the evolution of the gas industry have multiplied our problems of measurement, transportation and control of gas supplies.

So long as we were content to assume natural gas to be a perfect thing which would act in accordance

with our fundamental gas laws (Boyles Law for example) we were all right; but when we recognized that natural gas is not an individual but a family of gases, our troubles began. The elementary formulas do not apply and we have to take into account variations in compressibility, gravity, inert constituents, heat units, flowing temperature, moisture or gasoline content (sometimes carried in suspension), and different pressure bases due to different altitudes at the buying and selling ends of a single pipe line system.

When gas men began to realize that there were unsolved problems it was a hopeful sign. The most encouraging fact today is that those men are really thinking about their troubles and how they can be solved. They are helping all they can, and are very grateful for all the assistance they can get from those agencies equipped with men equal to the problem.

What Price Ammonia?

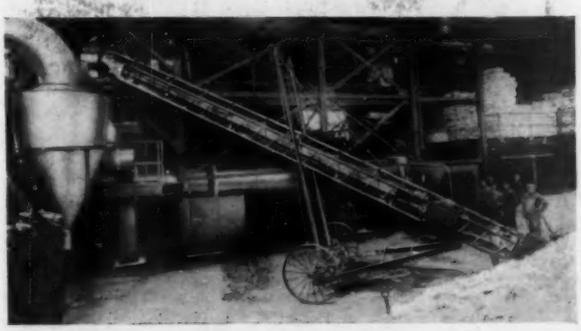
When Should the Small Coal-Gas Plant Make Sulphate, and When Liquor? When Does Ammonia Give a Credit, and When Create an Expense?

By A. M. Beebee

General Superintendent, Gas Department, Rochester Gas and Electric Corporation

Rochester Gas & Electric Corporation's Coke Oven Plant.

AMMONIA is one of the principal products of coal carbonization. And in the past whether produced in the form of sulphate or liquor it has usually netted a rather handsome credit to offset part of the cost of carrying on the carbonizing process. The advent of synthetic ammonia has, however, materially affected the ammonia credit, whether produced as sulphate or liquor, but particularly in the latter case.



Equipment for Handling Ammonium Sulphate at Rochester Plant

Ammonia in the form of sulphate has usually been produced by the large carbonizing plants which process over 1,000 tons of coal daily. In their case the reduced value of the sulphate has caused no problem other than the economic one resulting from its reduced value, since there is nothing at present for them to do to meet the changed conditions. In the case of the smaller carbonizing plants quite generally the practice has been to produce the ammonia in the form of concentrated liquor. The serious inroads that synthetic ammonia has made on the ammonia value in the form of liquor has caused not only financial loss but also compelled many of the plants producing liquor to consider whether they should install sulphate equipment.

A Serious Problem in Small Plant

It is interesting to see how far weak liquor must go in price before this change from liquor to sulphate becomes advisable. This problem is considered in this manuscript purely from the point of

view of the relatively small carbonizing plant, processing about 800 tons of coal a day. This is an important thing to keep in mind since a sulphate plant of small size is relatively very expensive both in fixed charges and labor, because the same equipment and labor can handle considerably greater tonnages. In other words, these two cost items in a small plant are not a function of tonnages produced but are a fixed amount daily, irrespective of the production. Hence, in small plants they become a very serious problem, or even prohibitive in magnitude. In the larger plants these items when reduced to a cost per ton of sulphate become smaller and do not assume such dominating importance.

Silica Gel Light Oil Treatment Plant, Rochester.

Some recent data on the costs of synthetic ammonia (Synthetic Ammonia Costs in America, by Prof. R. S. Tour. A. I. Ch. E. Proceedings, Vol. 20), indicating a very careful analysis of the situation, show that the present minimum cost of synthetic ammonia production is in the neighborhood of 6.5 cents per pound of NH_3. This cost appears to be about the same as the value which was realized from the sale of ammonia in the form of weak liquor prior to the advent of the synthetic product. However, the purity of the synthetic product and some of its other commercial advantages make it more desirable than the usual concentrated liquor, so that concentrated liquor has gone begging or has been sold at much reduced prices.

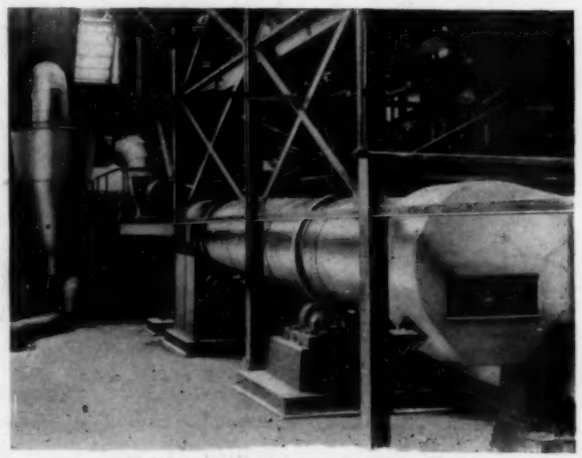
Now the problem comes. How far should the price be allowed to go before it is desirable to make sulphate? If the synthetic product is worth 6.5 cents per pound of NH_3 then the concentrated liquor has a long way to go before its value as a gas-works credit reaches the zero point. The determination of this point is an important problem for the gas man.

In considering the advisability of making sulphate, one of the paramount things to determine is, of course, the value of the sulphate after it has been made. The estimates of this value are many and the literature on this subject is large and beyond the scope of this paper to analyze. However, on this subject again it is interesting to consider fundamentals of synthetic sulphate, based on the above value of synthetic NH_3. In a ton of sulphate there is approximately 25 per cent NH_3 or 500 pounds, which at 6½ cents per pound is $32.50 for the ammonia alone. To this must be added the cost of the sulphate production. Therefore the possibility of sulphate market dropping below $40 to $45 for bulk sulphate as a result of the synthetic product does not seem imminent. The ammonium sulphate market has been approaching the latter figure and it would seem to be a fair figure to consider in this set up.

Cost Calculations

The cost of producing bulk sulphate in a relatively small plant of 800 tons of coal a day or 9 tons of sulphate per day would appear to be about as follows:

	Per ton of sulphate
(1) **Production Costs**	
Manufacturing labor	$3.60
Steam for still and engines	2.50
Lime	1.50
Acid, $5 freight and $12.50 acid	14.50
Repairs	2.90
	$25.00
(2) **Fixed Charges** of a plant of this size when including the sulphate-storage building, auxiliary equipment, acid-unloading and storage facilities, etc., will apply on a capital sum of probably close to $250,000. Hence— $\frac{250{,}000 \times 16\%}{9.0 \times 365} = 12.20$	12.20
(3) **Sales Expense,** including $4 average freight	7.50
(4) **Compression Expense.** The sulphate saturators require considerable back pressure on the gas and the necessary increase in power and investment required chargeable to sulphate is about $2.00	2.00
Total sulphate costs	$46.70
Value of sulphate	45.00
Loss on operation	$1.70



Ammonium Sulphate Dryer, Rochester.

In figuring the above fixed charges the ammonia stills and storage tanks have been included. In converting from a liquor to a sulphate plant, additional capital of this sort would not be required. This, however, is a minor item and will not appreciably affect the conclusions, as this item does not exceed $1 a ton of sulphate.

Conclusions

Drawing general conclusions from such data is always a dangerous thing to do, as relative economies are so much a function of local conditions and freight rates. Also, particularly in this type of problem, the conclusions are a function of the size of the plant. However, in considering the above data, an average location is considered, requiring $5 freight on acid and $12.50 acid cost and approximately $4 average freight on the sulphate produced. Also a plant of approximately 800 tons of coal a day has been assumed. With changes in tonnages the fixed charges as shown above will vary, while the other items will remain approximately as shown.

With the above assumptions the following conclusions seem reasonable:

(a) At present sulphate prices the credit for ammonia when all charges are included disappear entirely when considering a small plant around 800 tons of coal a day.

(b) If a plant using about 800 tons of coal a day or under is producing ammonia liquor then it probably is better to stay on this basis even if the net credit for the liquor drops to practically zero, rather than to go to sulphate production.

(c) In constructing a new plant, until sulphate prices change, if any net credit at all for liquor can be realized such would appear to offer a better basis of operation.

(d) If a market is not available at any price, making of sulphate will at least get rid of the ammonia, which must be done; and sulphate income just about covers the expense of manufacture.

Water Survey in a Gas Plant

By Theodore C. Moran
Engineering Asst., the Syracuse Lighting Co., Inc.

THE plant under consideration is a modern coal gas plant of vertical retorts, whose total capacity is 5,800,000 cubic feet per day, which constitutes the base load gas to the city. Peak loads are met by carburetted water gas made in a separate plant located in a different section of the city. This latter plant operates at such low capacity that any water figures are not significant, and consideration of it will be omitted.

The operation of the retort plant is, of course, continuous over 24 hours, and the output is fairly uniform. Water consumption for strictly production purposes will therefore not vary much over 24 hours, or from day to day. For this reason only monthly consumption will be given attention.

The plant is served with city water from two systems, one being for emergency only. The city system is supplied from a fresh water lake 25 miles distant, and the plant is served from an 8-inch main at 90 pounds per square inch.

Where the Water Is Used

The principal points of city water consumption at this plant, which are more or less common to all plants of similar type are:

1. Boiler Feed. (m)
2. Regeneration of water treating apparatus. (m)
3. Hydraulic power cylinders.
4. Bearing and Cylinder cooling.
5. Producer Seals. (m)
6. Intensive Ammonia Scrubbers. (m)
7. Ammonia Concentrator Condenser. (m)
8. Ice Machine Condenser. (m)
9. Laboratory.
10. Lime mixing. (g)
11. Soda mixing. (g)
12. Sanitary.
13. Restaurant.

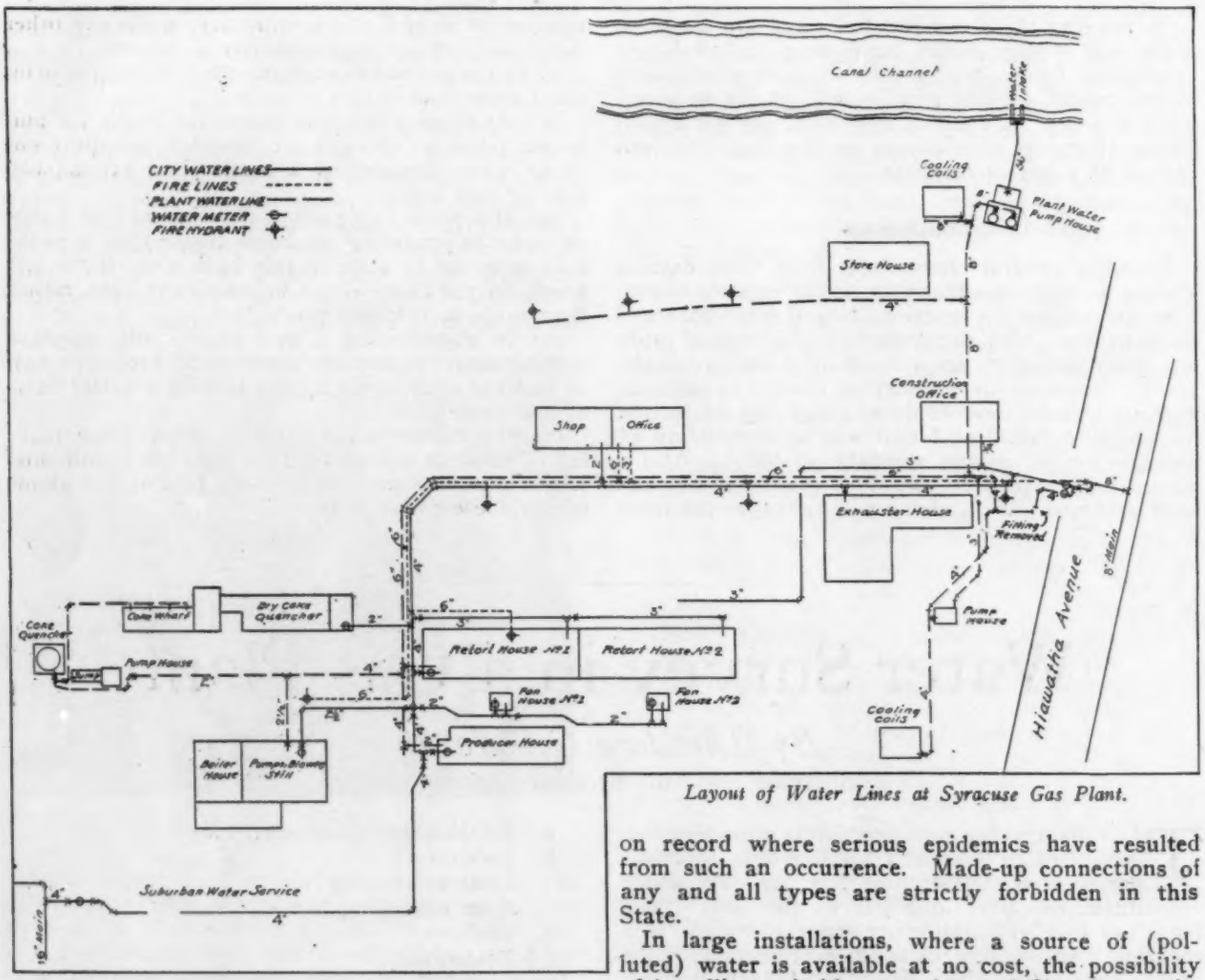
Items marked (m) are metered, marked (g) are gauged. Others may be calculated when necessary. Minor uses of water which are less important are:

1. Wetting coke for delivery.
2. Washing boilers.
3. Hydraulically operated gas governors.
4. Make-up to washer coolers, hydraulic main seal, etc.
5. Holder seals.
6. Fire protection.

Canal Water Use

In addition to the city water system, a system of lines supplied with plant water is also operated. This water is taken from the adjacent state canal channel by pump, distributed throughout the entire plant, and returned to the canal. The pump operates at 70 pounds per square inch pressure, is motor driven, and has a capacity at this pressure of 1,200 gallons per minute. This water is highly contaminated and carries much floating refuse as well as some suspended matter. The large material is effectively removed by a moving self-cleaning screen requiring 3 H.P. to operate. Due to its nature, the use of this water is restricted, but it is satisfactory at the following points:

1. Cooling Coils.
2. Wet quenching of coke.



Layout of Water Lines at Syracuse Gas Plant.

3. Producer seals and safety seals.
4. Wetting oxide.
5. Gas condenser.
6. Ammonia concentrator condenser.
7. Retort hose line.
8. Fire protection.

No meters are installed in this system. The largest single use of this plant water is for cooling coils. Winter temperatures of the water are slightly above freezing, but during summer months temperatures as high as 75 degrees are reached, this being a shallow, nearly stagnant channel. At this period excessive quantities are required by cooling coils, and also the limiting temperatures is somewhat higher than that desired in the gas. Also, a deposit of the suspended material rapidly builds up on pipe surfaces which seriously decreases the efficiency of coils and must be removed periodically. For these reasons plant water alone is not sufficient during the entire year for cooling, and it has been found advisable, in this case, to provide additional cooling by mechanical means.

It is important that the greatest care be taken to prevent any backing of this contaminated water into the city water system, as such a condition would be highly dangerous to health. Cases are on record where serious epidemics have resulted from such an occurrence. Made-up connections of any and all types are strictly forbidden in this State.

In large installations, where a source of (polluted) water is available at no cost, the possibility of installing suitable screening and filtration equipment may be worth investigation. While purification of such water is probably in all cases out of the question, for such purposes as are found in the production processes, water should be free from suspended matter to maintain reasonable efficiency on heat exchanging and scrubbing surfaces. In the plant under consideration the use of the plant water on a certain condenser was abandoned because of rapid building up of slimy deposit on the tubes. This condenser requires a large quantity of water and the resulting expense of city water is considerable.

Advisability of Filtering

When water is bought at a high rate, an investigation of investment charges on necessary equipment and operating cost of same, balanced against cost of bought water, and improved efficiency at points of utilization, may show the advisability of filtering a (polluted) water for process use.

However, in the general case, water must be purchased and it is in the utilization of bought water that the production man is chiefly concerned. Many of the causes of varying consumption are not directly under control, and the field of investigation is further limited by the number and location of me-

TABLE I

METERED	Month of August, 1927 — BOUGHT WATER 10,789,556 gals.	31 days = 100.00%	
Metered	Used in Boilers	1,654,300	= 15.3
Metered	Permutit Regeneration	351,126	= 3.3
Calculated	Hydraulic Cylinders	390,600	= 3.6
Metered	Bearing Cooling	1,904,482	= 17.7
Metered	Producer House	314,384	= 2.9
Metered	Ammonia Scrubbers	367,070	= 3.4
Metered	Ammonia Concentrator	1,073,088	= 10.0
Metered	Mechanical Cooler	346,878	= 3.2
		6,401,928	59.4
	All other uses	4,387,628	40.6
	Average Atmosphere Temperature	65° F.	

tering devices. In the plant under consideration, secondary meters are installed at the points designated above. An investigation of the water consumed at these points during two representative months gives the results tabulated in tables 1 and 2. In both cases, approximately 41 per cent of the total water bought is not metered. The items then included in this 41 per cent are as given under unmetered water. It is estimated that more than 50 per cent of this amount of water, or 1,500,000 to 2,500,000 gallons, is used for sanitary purposes. The plant under consideration is unusually well equipped with these conveniences, and as no effort is made to discourage their use, water consumption in this item is undoubtedly high.

Comfort of Men Catered To

Another item not common to all plants is the restaurant water consumption. Roughly, 150 men are fed here daily, and the several water consuming appliances are in nearly continuous operation during the day. Also a washing machine is at the disposal of the employees at all times, and the consumption at this point is considerable. However, as the operations of the plant are more or less strenuous and dirty, the comfort and convenience of the crews is a factor of highest importance and although needless waste in the personal uses of the water is certainly not encouraged, there are no other restrictions on its use.

Water used in the laboratory is a considerable part of the unmetered water. The equipment includes a sink and two one-half inch faucets, and a work bench equipped with a one-half inch line and six one-quarter inch cocks. Routine analysis and testing require nearly complete utilization of these facilities daily.

Two hydraulically operated gas line governors are in continuous operation on the lower foul gas mains from the retort houses. While hourly rate of this water is low, its continuous consumption makes an estimate of 1,000 gallons a day conservative.

There are various points in the liquor circulating system at which make-up with city water is necessary at intervals. Such are the washer cooler, hydraulic main, cyanogen scrubber, etc. The amount of this water is low.

Where Considerable Water Is Used

The most essential demand for city water is boiler feed. This water is metered before feeding to boilers, and also through flow-meters on the individual steam lines from the boilers. The boiler equipment consists of two horizontal boilers of 150 boiler H.P. each, at 125 pounds per square inch; gauge, stoker fired two vertical Gas Tube Waste Heat Boilers of 190 boiler H.P. each at 125 pounds per square inch, gauge; four 10-foot 6-inch Gas Producers, with 6-inch water jacket, operating at

TABLE II

Month of December, 1927 — BOUGHT WATER 8,471,848	31 days = 100.00%	
Used in Boilers	1,565,800	18.5
Permutit Regeneration	344,883	4.1
Hydraulic Cylinders	386,500	4.6
Bearing Cooling	1,904,482	22.5
Producer House	41,611	.5
Ammonia Scrubbers	323,520	3.8
Ammonia Concentrator	442,958	5.2
Mechanical Cooler	0	0
	5,009,754 =	59.1
All other uses	3,462,094 =	40.9
Average Atmospheric Temperature	29.6° F.	

5 pounds per square inch, gauge. As operated, the total steam load is about 550 boiler H.P. Feedwater is preheated to 210 degrees F. after treatment by the zeolite softener. This equipment consists of two units, cylinders 6 inches diameter by 9 feet 1 inch in height, and has a rated capacity of 38,400 gallons in seven and one-half hours, maximum rate 5,120 gallons per hour. The hardness of the city water shown by the analysis is 106 parts per million, total calculated as $CaCO_3$. The analysis at that time was:

	Parts per million
Ca	86
Mg	20
Alkalinity	100
Basicity	0
Caustuity	0
Free CO_2	3
Chloride	4
Sulphate	8
Iron	.1
Manganese	0

As generally known, in this period of treating calcium and magnesium are exchanged for sodium in the zeolite, and the zeolite regenerated for sodium by washing with common salt brine. This process has the advantage that it removes all the hardness, but requires frequent blowing down of boilers to keep the concentration of sodium down. Scale formation and all forms of corrosion are totally absent under this treatment. Together with the open heater, a very satisfactory operation results.

Regeneration

Regeneration is performed in three steps:

First: The unit is shut off and backwashed with fresh water at a rate of 90 gallons per minute until resultant water is clear. As the flow is downward through the zeolite bed during operation, this wash is made in the reverse direction.

Second: A saturated solution of salt brine is injected into the unit, the concentration being 26 per cent sodium chloride.

Third: This brine is removed by rinsing with fresh water, using a rate of 45 gallons per minute. During the rinse the rinse water is tested with standard soap solution until a good lather is obtained, showing the absence of salt, and the completion of regeneration. Nearing the end of a run on a unit, the same soap test is used to determine the point at which water is coming off hard, and indicates the time for regeneration. This is normally 19,000 gallons, although in the winter season when extreme cold persists, it has been cut to 16,000 gallons.

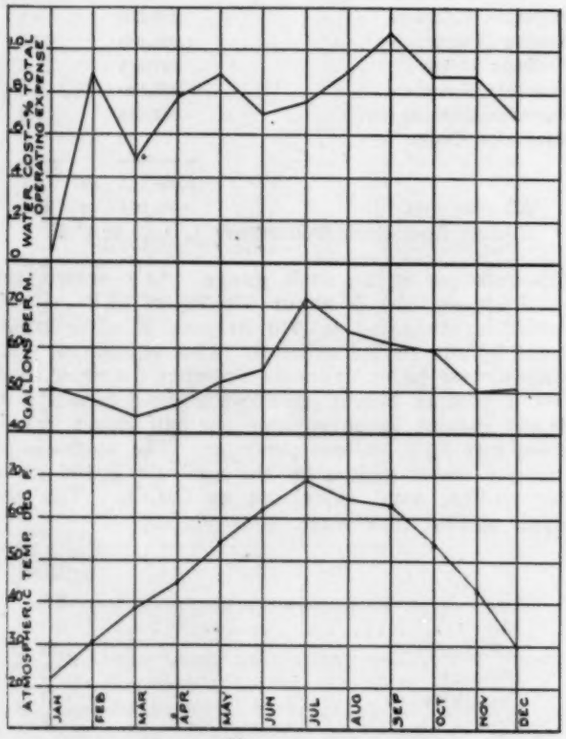


Figure 1

The consumption of salt and water for regeneration for the months previously considered is as follows:

August, 1927

Total water treated	1,654,300	gals.
Total salt used	12,000	lbs.
Total water used for regeneration	351,126	gals.
Salt used per 100 gal. water treated	.725	lbs.
Water used per 100 gal. water treated	21.2	gals.

December, 1927

Total water treated	1,565,800	gals.
Total salt used	11,600	lbs.
Total water used for regeneration	344,883	gals.
Salt used per 100 gal. water treated	.741	lbs.
Water used per 100 gal. water treated	22.0	gals.

A subsequent analysis of the city water reported by the local city hall analyzed by New York State shows the hardness content somewhat higher than previous analysis:

	Parts per million
Calcium Carbonate	108
Ca	33
Mg	6.1
Bicarbonates	111
Chlorides	1.5
Sulphates	13.0
Other carbonates	1.0
Iron	.24
Nitrates	124

This increased hardness, together with the high hourly demand, exceeds the rating specified and cuts down somewhat the capacity treated between regenerations. This may be somewhat compensated for by certain modifications in regeneration procedure, but in all, a decreased capacity results. However, the continued satisfactory results in softening under these conditions speaks well for the equipment.

Water Consumption Relations

Figure 1 shows the result of an investigation of total monthly consumption during 1927. The consumption of water, in gallons per M. of gas made was plotted, and since the production of gas varies but little from month to month, this curve also represents the variation in total consumption. With this curve was plotted the expense for water as a percentage of total operating expense, to show the relation between water consumption and total expense. There does not appear to be any definite relation, the variation in expense for water being all within one per cent of the total. The high consumption of water during the months of June, July and August suggested the third curve, average atmospheric temperature by months with the result shown, i.e., the water consumption per M. follows rather closely variations in temperature, except for months of January, February and December. From this, the fourth curve, figure 2, was suggested, water bought, against average monthly temperatures from which the smooth curve shown was drawn. In general, higher atmospheric temperatures indicate high consumption of water, but extreme low temperatures call for rising water consumption due to increased boiler load, as low atmospheric temperatures increase line loss due to condensation, and

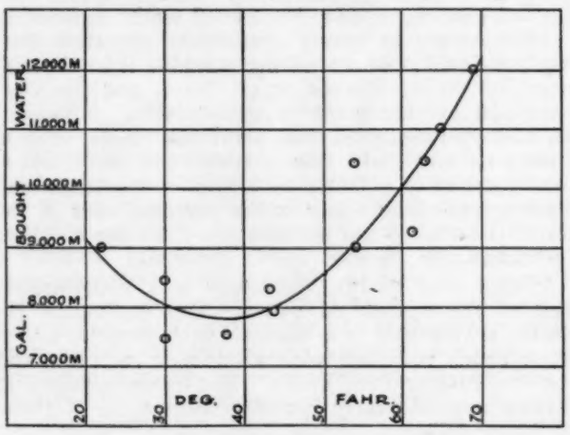


Figure 2

also slightly higher back pressures are necessary on the exhaust system to maintain sufficient pressure for space heating.

The included sketch is designed to show the layout of the principal lines in the city and plant water system. Beginning in Hiawatha Street with an 8-inch service, a tee reduces to 6-inch, for the fire line, and a lateral 6-inch feeds the city water system. These lines are cast iron, caulked points in sizes of 4-inch and larger. Below that, wrought iron galvanized flanged or screwed are used. The fire line supplies only the fire hydrants, no laterals of any kind being connected into it. From sizes marked on different lines it is seen that as present furthest points of consumption are reached in certain sections, chiefly at retort house, fan houses, boiler house, no reduction in size occurs. This is to provide sufficient line capacity for future installations of equipment, to be added beyond this point.

The sketch also shows the manner of pumping and distributing the plant water. A concrete intake is provided at canal bank from which a 36-inch cast iron line runs to the water screen and pump sump at pump house. Eight-inch and 6-inch lines distribute this water from the pumps to the system. The 4-inch hydrant line shown is used to supply water for oxide handling.

The possibilities of economizing in the consumption of bought water, by utilizing a second time, must not be overlooked. In the plant under consideration, boiler feed water is first passed through one of two water tube condensors before going to the open heater. Another gas condensor has recently been connected to a supply of water consisting of the accumulated returns and overflows of several small flows of city water, which with a float adding make-up as needed, is quite satisfactory.

In some cases, investigation may disclose the fact that new and more efficient apparatus, if installed, may soon pay for itself, through a saving in water consumption. Cast iron condensor tubes of the ammonia concentrator were recently replaced with aluminum tubes, and the resulting improvement in both water consumption and operation has been very marked.

Although the cost of water is not one of the large items in operation expense, still an appreciable saving is possible in many cases. This will result only from careful study of consumption and conditions affecting it. For that purpose, the installation of metering devices covering points under observation, is essential. Normal operation of some units will require metering and at those points meters are found. However, consumption at many other points can be controlled and it is believed installing meters at such points will pay. In the plant under consideration, 41 per cent of total bought water is not re-metered. Referring to the sketch, the 2-inch line supplying the shop and office building supplies the water used in the laboratory, washroom, showers and restaurant. A meter at this point will show interesting variations in water used, and provide a check on a large item of consumption. Other points might be mentioned, but the location of the meters will depend entirely upon the layout in each plant.

Table 3 is a summary of the data obtainable and used for previous curves and discussion.

TABLE III

1927	Water Bought	Coal Carbonized	Gas Made	Average Temp.	Total Water Cost	per M.	Gals. per M.	Water Cost	Boiler Feed
January	8,971,417	29,884,450	175,768,000	22.8	58.00	.03	50.5	.0485%	1,636,200
February	7,605,300	26,814,620	158,831,000	30.4	977.47	.62	47.9	.846	1,486,500
March	7,569,149	28,415,068	173,014,000	38.2	563.87	.33	43.7	.463	1,552,000
April	7,938,239	28,009,570	168,940,000	44.1	953.63	.57	47.0	.786	1,601,700
May	9,090,406	28,837,885	172,157,000	54.0	1064.14	.62	52.3	.88	1,524,100
June	9,307,125	28,250,395	169,311,000	62.2	823.15	.49	55.0	.73	1,527,900
July	12,014,737	28,374,520	167,663,000	69.4	912.82	.54	71.7	.76	1,981,000
August	11,066,482	29,131,000	172,706,000	65.0	1064.75	.62	64.1	.91	1,654,300
September ...	10,528,927	28,916,150	171,986,000	63.3	1229.81	.72	61.2	1.08	1,656,800
October	10,436,851	29,933,120	175,051,000	54.2	1031.47	.59	59.5	.86	1,886,100
November ...	8,356,925	28,776,320	166,294,000	42.9	976.22	.59	50.2	.86	1,596,500
December	8,492,447	29,190,180	166,775,000	29.6	836.10	.50	50.9	.68	1,633,300
Total	111,378,001	344,533,296	2,038,496,000		10,491.52				
Average .	2,290,000					.52	55.8	.74	

WORKMEN'S COMPENSATION

A tendency to liberalize workmen's compensation laws by the allowance of larger payments for death or disability is disclosed in a digest of state laws and the federal law issued by the Insurance Department of the Chamber of Commerce of the United States.

"The percentage of wages paid as compensation," the Department says, "is 60 per cent in six states and one territory, 65 per cent in eight states and one territory, 66-2/3 per cent in fourteen states besides the two federal acts, so that twenty-eight states as against twenty in 1920 pay 60 per cent or more. In 1920 twelve states fixed the maximum weekly payments at $12.00 or less. Now no state has a maximum less than $12.00 for temporary total disability and only three have as low a maximum as that, while twenty states, one territory and two federal acts pay $18.00 or more, as against seven states and one territory at the earlier date. The waiting time is now less than one week in seven jurisdictions; one week in twenty-eight states, one territory and one federal act; and more than one week in eight states and one territory. At the earlier date only four laws fixed a waiting time of less than one week; twenty-one, one week; and seventeen states and two territories more than one week."

Some Observations Concerning Rules Under Which Utility Companies May Be Required To Make Extensions

By Philander Betts

Chief Engineer, New Jersey Board of Public Utility Commissioners

FOR two years prior to our entrance into the war the demand for money for financing construction and operation of factories and for labor for the operation of factories was so great that the utility companies began to have difficulty in obtaining the funds needed to make the ordinary and usual extensions to their plants and distribution systems to keep up with the normal increase in population. As a result, but few additions to utility plants were made during the war excepting for war purposes and where wholly or partly financed from government funds.

Following the war there was a revival of industrial activity which in turn led to the expansion of many municipalities and the construction of new homes, most of them of a cheaper character than normal, and in locations where it was necessary to make extensions to distribution systems in order to furnish service. After the close of the war, namely, in 1919 and 1920, costs of construction continued to increase, and this, coupled with the fact that the service required for the new residences was less than normal, due to the character of the houses being built, it becames practically impossible to make extensions which would be anywhere near self-supporting. For instance, the normal price for a six-inch water pipe installed, but not including pavement, rose from 89 cents per foot in 1913 to $1.90 in 1920 and 1921.

A Flood of Complaints

The demand for extensions was so great and the inability and unwillingness of the utility companies to make extensions so general, that our Commission was flooded with complaints from all parts of the State against all classes of utility companies to the effect that service was not available. In addition to our regular staff, five men were employed for about six months in order to bring this class of investigation up to date. It finally resulted in the development of a set of rules made up from our experience gathered in the investigation of these complaints.

Read at Conference of Public Utility Commission Engineers, U. S. Bureau of Standards, Washington, May 31-June 1, 1928.

In developing the form that these rules should take, I obtained from every State Commission in the country information, first, as to whether it had jurisdiction; second, whether it had taken any action along these lines; and third, full information as to the rules adopted. I found that where rules had been adopted they were of several classes. In a number of cases Commissions had required that for each customer the company must lay a certain length of main or expend a certain amount of money, without definitely relating this length of main to required expenditure to the anticipated revenue. It clearly follows that a company is justified in investing a larger amount in an extension of the distribution system if the anticipated revenue from the property to be served is larger than the average.

Simple Rules Needed

Several of the States, namely, Indiana, Illinois and Minnesota, had rules definitely relating the required expenditure to the anticipated revenue. Some of the rules, however, are quite complicated, and as our Commission always retains the power to hear and decide any particular case on its own merits, we felt that the simpler the rules could be made, the better it would be for all concerned. Furthermore, in view of the fact that many of the extensions were being brought about by land developing agencies, we felt that it was important to make two general rules, one applying to applications for extensions made by the land development agencies, and the other applying to individuals or groups who lived just beyond the area already served. With regard to developers, our rule requires that the development company must deposit with the utility the entire amount of the cost of installing the distribution system. Moneys would be returned to the depositor if and when connections were made to actual bona fide customers in accordance with the same mathematical rule applying to other applicants.

Our rules provide that the company shall expend on an extension of the distribution system itself a certain number of dollars for each dollar of anticipated annual revenue; the water company an expenditure of $3.50, the electric company $3.00, and the gas company $2.00 for each dollar of annual revenue. A little study of these figures, applying

them to specific cases, will show that this rule is one under which a company may always be compelled to expend money if the estimate of the cost of the extension takes in all elements of cost.

The Two Plans for Handling Matter

There are two plans for disposing of the matter. If the cost of an electric extension exceeds three times the annual revenue (or a water extension three and one-half times, or a gas extension two times), an amount equivalent to this excess cost must be deposited by the customer, to remain without interest for an indefinite period. If and when the annual revenue exceeds the amount upon which the extension was calculated, a refund must be made to the customer of (electric) $3.00 for each dollar of additional annual revenue. The matter of refunds holds for ten years. No refunds are made after that, it being assumed by that time that the extension will never become fully profitable. There is another way in which this may be disposed of. and that is a guarantee on the part of the customer of the revenue required to support the extension based upon the same mathematical rule. It is provided, however, that the company may not be required to accept a guarantee more than 50 per cent in excess of the normal revenue.

There have been two classes of cases which have led to special decisions. One is in the case of specially expensive construction which is out of all proportion to the normal expense in that particular territory, and the second is the situation brought about by the corner lot.

An example of the first case was an extension in southern New Jersey where the construction generally is of a low grade, comparatively light weight poles, and but a small amount of service required per mile of line. In the case in point, due to the necessity for crossing the West Jersey & Seashore Railroad Company with its 33,000 volt transmission line, it was necessary to install an underground section for about 200 feet. The company contended that in estimating the cost of this extension, the total cost of making it should be taken into account in computing the deposit or revenue guarantee as the case might be. It was clear that the line at some time in the future would be further extended and the Board decided that the extension should be made on a basis of average costs in that part of the state.

Another special condition which has annoyed everyone who has dealt with this subject is the effect of the corner lot. At least one city, somewhere in Connecticut, I believe, provides that in the service of properties involving an extension along the side of a corner lot, in calculaing the cost of the extension, 100 feet shall be eliminated and no charge made for that much of the side of the corner lot. I have worked out a little example to show the effect of this and have assumed a town having five streets in a north and south direction and five in an east and west direction, the streets normally fifty feet in width, and the blocks 300x300. In order to give the advantage as much as possible to the houses facing on the side streets, I have assumed that all of the main streets running east and west, we will say, are piped with six-inch pipe, and that all cross streets, running north and south, are piped with four-inch mains. With a house on every 50 foot lot, the east and west streets will accommodate 480 houses. They will be served from the six-inch mains. There will be but 80 houses served from the four-inch mains on the cross streets, or a total of 560. There will be 7,000 feet of six-inch main at $1.30 per foot $9,100; 7,000 feet of four-inch main at $1.00 per foot, $7,000, or a total cost of mains of $16,100.

Under our rule, to support a system of mains of such an extent, assuming that these are water mains, an annual revenue of $4,600 would be required, or an average of $8.21 per house, which is. of course, very low. If we were to say to the company that, in making its extensions, it must eliminate from consideration 100 feet of the side line for each corner lot, we would bring down the base upon which the investment would be calculated, although not the investment itself, to $12,100. If this is done, we are practically saying to the company that it may not require a gurantee of revenue in excess of $3,460 and instead of saying to the water company, as we now do, that it must expend $3.50 for each dollar of annual revenue, we would be saying that it must expend $4.65 for each dollar of annual revenue.

Although many water rates have been increased, we still have a number where the minimum charge is as low as $12 per year. This occurs, however, in seasonal resorts where the houses are not open throughout the year. If we assume that the town is fully built up with 560 houses, as stated above, and with a minimum of $12 per year from each house, we would have a gross revenue of $6,720, which is ample to permit the deduction of an allowance of 100 feet for each side lot. If 68.5 per cent. of the lots are occupied by water customers at the small revenue of $12 per annum, the water company will be fully justified in piping every street in the town, without any special guarantees. I would call attention, however, to the fact that figures, used in computing the cost of mains, are present day figures. The cost of water mains in 1920 and 1921 was such that with one house for each 50 foot lot the normal gross revenue would in no case support the investment on a basis that would justify a Public Service Commission in compelling a water company to make such an extension.

Gas Extension Figures

Gas extensions present figures quite different from those applying to water. The average gas revenue per small house is nearly $30, of which a larger proportion is needed to meet operating expenses.

Low pressure gas mains will cost about the same as water mains per foot of street. Again assuming our town with 560 houses; a cost for mains of $16,100; and a gross revenue of $30 from each of 560 houses or $16,800—on our ratio of $2.00 in mains to one dollar of gross revenue, the gas company can afford to pipe the entire town if 48 per cent. of the lots are occupied by gas customers.

The adoption of our extension rules has had the desired result in eliminating the great volume of extension complaints. In the cases that have come before the Board we have not made any allowance for the corner lot. as the cases so far before the

Board have had to justify themselves without reference to any other extension. The bookkeeping in connection with these extensions has brought about another matter, and that is, that in the investigations of the companies' books in connection with applications for approval of security issues, care has had to be taken to ascertain just how much money had been deposited to finance extensions in order to determine the basis of the security issues. some companies having erroneously claimed that such deposits constituted a debt which must be paid off and that the issue of securities must be approved so that they could be paid off. The fact of the matter is that if and when they are actually paid off, the securities in corresponding amount must be authorized, but not until they are paid off.

Since the adoption of these rules most of the companies have given up pioneering, that is to say, they are not reaching out into unoccupied territories as freely as they at one time did. Some of the companies are making practically no extensions except in accordance with our extension rules. This would naturally have the effect of keeping the going concern value (if determined by the cost of establishing the business, made up as it is of accumulated deficits, etc.) stationary, and this should be taken into account in determining the going concern value in any future rate case where it is shown that the company has entirely given up the old policy of pioneering.

Office Methods in Gas Companies

XII---Purchasing Department Records---Part II

By G. L. Harris

IN the preceding issue of the Journal, we discussed the fundamental and central record of the Purchasing Department, "The Purchase Record". We showed the importance of this record as a source of information, and we emphasized the fact that such a record must be built step by step. It cannot be bought, all ready to use.

But this is not the only important record of the Purchasing Department. For this department of the Gas Company must handle a tremendous volume of papers. And of all the departments, this one must be able to locate them most quickly. For every other department of the company comes here —impatient, hurried, exasperated—and expects an answer, definite and immediate.

In this article, therefore, we shall discuss certain other important records of this most important department.

Quotation Records

Quotations are valuable, not only as a basis for placing a certain specific order for material, but as a means of comparative reference on all future similar orders. Frequently the quotations are needed as a means of justification for a course of action followed by the Purchasing Department. Every Purchasing Official recognizes this value, and usually he takes particular pains to see that quotations are carefully recorded and filed.

No doubt because of this fact we find so many complicated and detailed methods of keeping track of quotations. They originate because the Purchasing Official "can't depend on the files", or because "the files won't take care of all the problems of handling quotations."

We doubt very much whether there is any Purchasing Department where the quotations are of such a nature that they cannot be cared for acurately, and where reference cannot be made to them with certainty, by the use of a simple, well arranged alphabetical file, based on the names of the articles on which the quotations are secured.

Basis for Quotation File

The indexing of the quotation file depends of course on the particular needs of the department, and we recommend that the quotations received over a period of at least one full year be taken as the basis for the organization of the quotation file. These quotations present a picture of what can be expected in succeeding years.

If, for example, the Purchasing Department has secured a large number of quotations on some few items of material, it will very likely continue to secure a large number of quotations on the same material. For this reason, by bringing together the quotations secured over a specific period of time, any Purchasing Department has within itself sufficient data to make possible an accurate analysis of the indexing requirements of the quotation file.

In one case, for example, it will develop that one individual folder, labelled with the name of the material concerned, will care for a year's quotations. In another case more than one folder will be needed, according to past experience. It may be that so many quotations will be secured on certain items that dated folders, monthly, quarterly, or semi-monthly, will be needed in order to care for them properly.

This is the twelfth of a series of articles by Mr. Harris. The next article will appear in an early issue.

In every case where more than one folder is required, a special guide must be provided for the particular class of material. This is so because the more often a particular part of the file must be referred to, the more essential it is to designate this part of the file with particular clearness. And in this connection we would say that practically every supply company has developed its indexing equipment to meet just such conditions in files of papers.

The Quotation Routine

Purchasing Departments which request a large number of quotations usually find it advisable to use a printed form for this purpose. Some send this form to the vendor in duplicates that the vendor may retain a copy of the quotation for his own record.

The quotation routine which we shall describe is based primarily on the use of such a form, but it is equally adapted to the use of special letters requesting quotations.

We can best illustrate the quotation routine by citing a particular case. Suppose we are requesting quotations on two-inch pipe, and that we are asking three firms to quote. The request for quotation is typed in four copies, identical except for the address. Three copies are mailed. The fourth copy has listed on it, in the address space, the names of the three firms to which the requests were sent. This copy, containing the requisition number from which the request for quotations originated, together with a follow-up date, is filled in the folder labelled Pipe, Two-Inch. The follow-up date is placed in the lower right hand corner of the file copy, since this becomes, in filing position, the upper right hand corner. The proper date for following up the request for quotations must of course be determined by experience.

A tickler card, showing the words Pipe, Two-Inch, and the date of the request, is filed under the follow-up date in the tickler file. The operation of such a file has been discussed in detail in this series.

Each reply to the request goes direct to the quotation file. It is attached to the file copy, and the name of the firm replying is checked off on the file copy. It is thus possible to see at a glance just which firms have replied and which have not.

Very often all of the replies are received before the follow-up date arrives. Upon the receipt of the third reply in our pipe example, the other two replies, together with the file copy, are removed from the file. The requisition is attached to these. and the tickler is removed from the tickler file and destroyed.

But if the replies are not all received before the follow-up date arrives, the tickler will bring the request up for consideration. The Purchasing Official will then either defer the follow-up date for a day or so, send record requests to the firms that have not replied, or place the order on the basis of the quotations that have been received.

When the order has been placed, the purchase order number is placed on the quotation of the firm which secured the order. The quotations are then returned to the quotation file, the successful quotation being placed on top of the file of quotations for that particular order.

Under this arrangement the quotation file presents a complete story at all times. It contains all past quotations and all quotations not yet represented by purchase orders. In short, there is only one place to look, and this is always an ideal situation.

The Purchase Order Files

We have found it best that two copies of the purchase order remain in the Purchasing Department: a master copy and a working copy. We do not mean by this a numerical file copy and an alphabetical file copy. The master copy, usually number two of the purchase order form, should be filed at once, permanently, in a file from which it cannot be removed. A purchase order must never be lost. And only a fool-proof file will prevent missing orders.

The usual method of caring for the numerical file is by a flexible post binder equipped with a locking device. The master copy of the purchase order should go, as soon as possible after the order has been written, to its proper place in this binder. And until the order is filled and all invoices against it have been passed, it should never be removed for any reason.

We do not find an alphabetical file of active purchase orders in the average Purchasing Department. The maintenance of such a file is of doubtful value, and it requires much clerical time. The entire science of purchasing is built around the purchase order number. Seldom indeed does a vendor omit the purchase order from his package or from his invoice.

We do not recommend, therefore, both an alphabetical and a numerical file of active purchase orders. Nor do we agree with the practise of some Purchasing Officials who have only an alphabetical file and who attach to the purchase order all papers and correspondence relating to that order.

The objections to such a file are:

(1) The orders can be, and are, removed from the file and kept out—for many reasons. Much time is lost because of this, since the order file is in such constant demand.

(2) Checking of invoices and receiving tickets is much slower than if the orders were filed numerically.

(3) Loose orders, handled so constantly in an alphabetical file, become torn and unsightly.

(4) Quotations, if filed with the order, are not easily available and it is not possible to have a complete quotation file.

If an alphabetical file of active purchase orders seems advantageous enough to outweigh these obvious disadvantages, then such a file should be maintained. But the experience of the large majority of Purchasing Departments does not confirm this necessity.

The Working Copy of the Purchase Order

The working copy of the purchase order is used for clerical work within the Purchasing Department. From it the entry on the Purchase Record is made, and it can also be used as a tracing copy. If filed under a follow-up date, it can quickly be compared witth the master copy of the purchase order

when the follow-up date arrives, and if the order is completed it can be destroyed. If not, the tracer can be sent and the working copy can be set ahead so as to bring the order up for consideration on any definite determined date.

The Change Notification Sheet

We cannot discuss purchase orders and feel that the job is complete without considering changes in them. There are many justifiable reasons for such changes: the vendor may not be able to fill the entire order; he may advise the purchase of a different quantity than the order calls for in order to secure a better package price or a better freight rate; price changes may be necessary; the entire order may have to be cancelled.

A purchase order routine, therefore, which does not provide a regular method for controlling changes, is weak at a vital point.

No purchase order should ever be changed except by instructions from the Purchasing Department. But when an order is changed, the change should be made systematically and thoroughly. A regular form should be provided and a change notice should be sent to every place where a copy of the original Purchase Order went. Within the Purchasing Department one copy of the change notice should be bound in the file of master purchase orders, next to the order effected by the change. Obviously the change notice should be of a different color than the purchase order itself.

One copy should of course go to the Purchase Record, and should then follow whatever route the working copy of the purchase order followed in the Purchasing Department.

The Change Notification Sheet shown here has proved very effective. Note particularly the statement reading: "No changes in, or cancellations of purchase orders will be recognized unless authorized by this Change Notification Sheet, issued only by the Purchasing Department".

Every Purchasing Department should have a form such as this, as an integral part of the Purchase Order Routine.

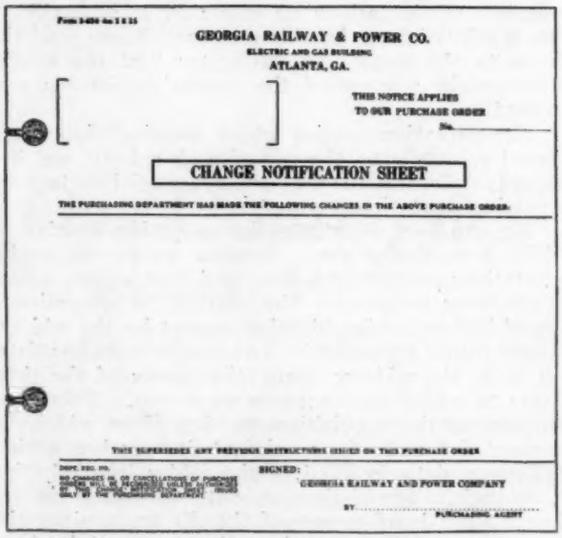
The Catalogue File

We have mentioned a number of files peculiar to the Purchasing Department, but none is more important from the point of view of ready accessibility, than the catalogue file.

Since this file must provide for catalogues of widely varying size, the problem of filing so as to secure ready reference, and at the same time have a presentable arrangement, requires careful organization and detailed planning.

Large book size catalogues are best filed in sectional book cases. Pamphlets and other catalogues not suited for filing in book cases should be filed in folders, vertically, in standard filing cabinets. In organizing a catalogue file we first group the catalogues to be filed in the bookcase according to size, without regard to alphabetical or other arrangement, except that all catalogues from any one firm are kept together. We pay particular attention to this placing of catalogues of the same size together in the bookcase, because of the fact that a neatly arranged file tends to perpetuate itself in the same manner, while a carelessly arranged file leads to carelessness on the part of those using it.

When a book size catalogue is received from a firm new to the book case files, the next unused number is assigned to this firm and the catalogue is filed in its proper numerical position in the bookcase. Such new catalogues may not, of course, fit into the files in places exactly suited to their size with reference to the adjacent catalogues, but if the original grouping of all of the catalogues on hand is carefully done, it will insure against many catalogues being filed in the bookcases in such order that difference in size will be conspicuous.



GEORGIA RAILWAY & POWER CO.
ELECTRIC AND GAS BUILDING
ATLANTA, GA.

THIS NOTICE APPLIES TO OUR PURCHASE ORDER No.

CHANGE NOTIFICATION SHEET

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER.

THIS SUPERSEDES ANY PREVIOUS INSTRUCTIONS ISSUED ON THIS PURCHASE ORDER

SIGNED:
GEORGIA RAILWAY AND POWER COMPANY
BY
PURCHASING AGENT

This form should be the same size and shape as the purchase order but of a distinctive color.

There are always many more catalogues suited to filing in folders in vertical filing cabinets than to filing in bookcases. Many firms, in fact, do not use book size catalogues.

Pamphlet size catalogues are best filed alphabetically, always. For each firm having more than one pamphlet size catalogue, we provide an individual folder in the vertical file. The index in this file must make possible ready reference to these individual folders. They must be capable of changes in indexing without confusion or expense. For this reason the Rand angle tab guides are especially adapted to caring for the catalogue file.

The transparent fibreloid tab is held at just the right angle to be instantly visible when the drawer is opened. The alphabetical designations are typed or printed on especially furnished perforated paper, torn apart on the perforations and inserted in the tabs. The subdivision guides, and the individual name guides, are placed on the folders. In case only one pamphlet size catalogue from a firm is in the file, we place this catalogue in the miscellaneous folder in its proper position, according to the index guide.

Usually, however, a firm will have an individual folder in the catalogue file, since most firms issuing pamphlets make different ones for different lines of material.

We do not generally advise making a card index to the bookcase file. As an index to the bookcase file we place a cross reference sheet in the vertical

folders for each book size catalogue. This sheet, on heavy paper, gives the description and number of the catalogue filed in the bookcase.

All reference is made direct to the alphabetical file, and the entire file of catalogues, or a direct reference to those of book size, is found in one place. The function of the number, which is placed on the book size catalogue, is principally to guide us in replacing the catalogue in the bookcase.

We realize of course that we have not covered all of the office problems of the Purchasing Department. We have not tried to do so. What we have done is to discuss those problems which are particularly pertinent to the Purchasing Department of the Gas Company, whether that company be large or small.

Exhibit at Atlantic City, A. G. A., Convention to be Largest Ever Held

THE exhibition of gas appliances and equipment at the American Gas Association Convention two years ago was the largest display of its kind ever held, either in this country or abroad. However, the coming Convention at Atlantic City in October will feature a display in this regard that will well surpass the 1926 exhibit, both in scope and number of exhibitors.

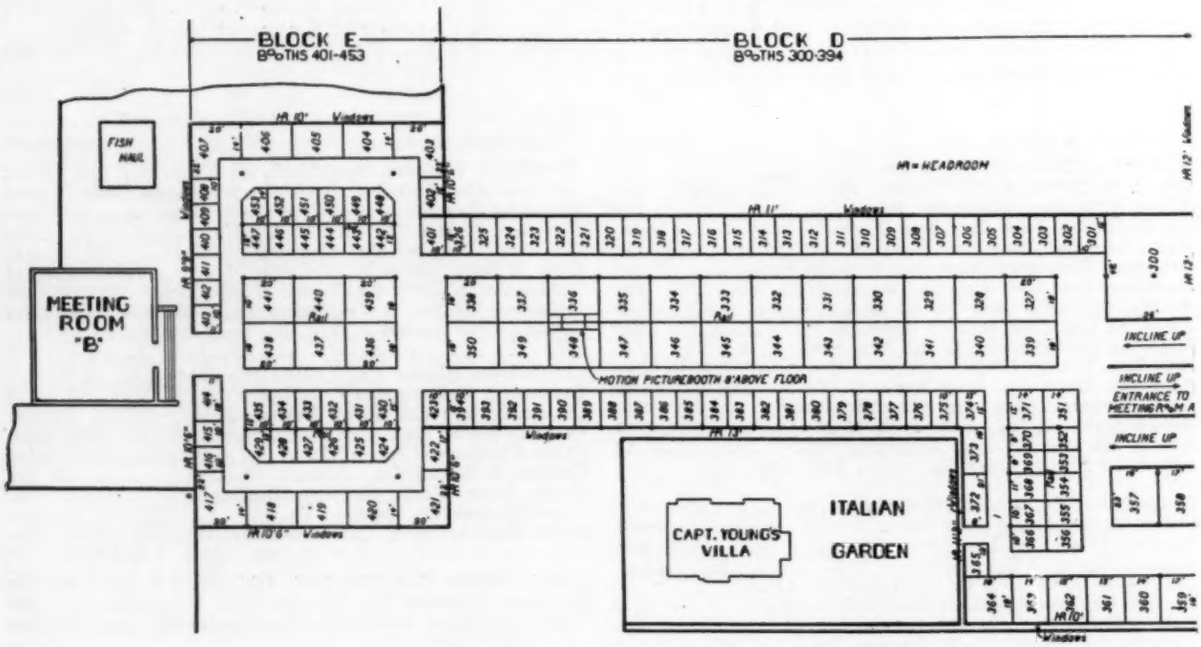
The list shown below (corrected to September 1st) presages a showing of equipment and appliances for the manufacture, distribution and utilization of gas that will be talked of for some time to come.

Plan to attend the Convention, arrange to take in many of the meetings, but do not fail to visit this record-breaking display of the tools of the Industry.

Name and Address	Booth
A-B Stove Company, Battle Creek, Mich.	344
Abendroth Brothers, Port Chester, N. Y.	345
AKme Flue, Inc., Baltimore, Md.	12
Air Reduction Sales Co., New York, N. Y.	13
Alpha-Lux Co., Inc., New York, N. Y.	65
American Aluminum Ware Co., Newark, N. J.	452
American Cast Iron Pipe Co., Birmingham, Ala.	201
American Gas Furnace Co., Elizabeth, N. J.	61, 62
American Gas Journal, New York, N. Y.	319
American Gas Products Corp., New York, N. Y.	115
American Heater Corp., St. Louis, Mo.	251
American Meter Co., New York, N. Y.	79
Apex Electrical Mfg. Co., Cleveland, Ohio	348
Arco Regulators, Inc., New York, N. Y.	18
Austin Machinery Corp., Muskegon, Mich.	57, 58
Automatic File & Index Co., Green Bay, Wis.	361
Bailey Meter Co., Cleveland, Ohio	127
Barber-Greene Co., Aurora, Ill.	220
Barstow Stove Co., Providence, R. I.	428
Bartlett Hayward Co., Baltimore, Md.	45, 46
Bartlett & Snow Co., C. O., Cleveland, Ohio	59
Bernitz Furnace Appliance Co., Boston, Mass.	69
B-Line Boiler Co., Cleveland, Ohio	347
Blodgett Co., Inc., G. S., Burlington, Vt.	383
Boone County Coal Corp., Philadelphia, Pa.	66
Bridge & Beach Mfg. Co., St. Louis, Mo.	426
Brinkvalve Corp., New York, N. Y.	447
Bristol Co., Waterbury, Conn.	37
Bryant Heater & Mfg. Co., Cleveland, Ohio	117, 118
Bullard-Davis, Inc., New York, N. Y.	124
Burgess-Parr Co., Moline, Ill.	437B
Burroughs Adding Machine Co., Detroit, Mich.	366-371
Byers Co., A. M., Pittsburgh, Pa.	438
Caloric Gas Stove Works, Philadelphia, Pa.	205
Carborundum Co., Perth Amboy, N. J.	68
Carrier Engineering Corp., New York, N. Y.	342
Celotex Company, Chicago, Ill.	254
Chambers Mfg. Co., Shelbyville, Ind.	132
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.	60
Chapman Valve Mfg. Co., New York, N. Y.	86
Chicago Bridge & Iron Works, Chicago, Ill.	114
Clark & Co., Geo. M., Chicago, Ill.	384, 385
Cleanliness Institute, New York, N. Y.	419
Cleveland Gas Burner & Appl. Co., Cleveland, Ohio	203
Cleveland Gas Meter Co., Cleveland, Ohio	50
Cleveland Heater Co., Cleveland, Ohio	346
Cleveland Trencher Co., Cleveland, Ohio	444, 445, 446
Clow & Sons, James B., Chicago, Ill.	313, 314
Collier Gas Heating Co., Lynn, Mass.	425
Columbus Heating & Ventilating Co., Columbus, O.	310, 311
Connelly Iron Sponge & Gov. Co., Long Island City, N. Y.	222
Connersville Blower Co., Connersville, Ind.	105
Consumers Construction Co., New York, N. Y.	10
Copeland-Silica Gel Corp., Detroit, Mich.	208-211
Crandall Pettee Co., New York, N. Y.	135A
Crane Company, Chicago, Ill.	122
Cribben & Sexton Co., Chicago, Ill.	312, 331
Crown Stove Works, Chicago, Ill.	253
Cruse-Kemper Co., Ambler, Pa.	41
Cutler-Hammer Mfg. Co., Milwaukee, Wis.	104
Dangler Stove Co., Cleveland, Ohio	386, 387
De arborn Chemical Co., Chicago, Ill.	120
Detroit-Michigan Stove Co., Detroit, Mich. Garland Division.	107, 108
Detroit-Michigan Stove Co., Detroit, Mich. Jewel Division.	343
Direct Action Stove Co., Lorain, Ohio	390, 391
Drake Non-Clinkering Furnace Block Co., New York, N. Y.	453
Dresser Mfg. Co., S. R., Bradford, Pa.	106
Dun-Rite Clock Device Co., New York, N. Y.	1
Economy Governor Co., Anderson, Ind.	451
Electric Indicator Corp., Stamford, Conn.	28
Ellis Adding Typewriter Co., Newark, N. J.	355, 356
Ensign-Reynolds, Inc., New York, N. Y.	134
Eriez Stove & Mfg. Co., Erie, Pa.	333
Estate Stove Co., Hamilton, Ohio	407
Favorite Stove & Range Co., Piqua, Ohio	434
Fisher Governor Co., Marshalltown, Iowa	20
Floyd-Wells Co., Royersford, Pa.	307, 308
Foxboro Co., Foxboro, Mass.	433

Name and Address	Booth
Gas Machinery Co., Cleveland, Ohio	53
Gas Purifying Materials Co., Inc., Long Island City, N. Y.	101
General Ceramics Co., New York, N. Y.	440
General Gas Light Co., New York, N. Y.	415-418
General Iron Works Co., Cincinnati, Ohio	408, 409
General Office Equipment Corp., New York, N.Y.	351, 352
Elliott-Fisher Division.	
Sundstrand Division.	
Giant Mfg. Co., Council Bluffs, Iowa	51
Glenwood Range Co., Taunton, Mass	323-325
Grayson Mfg. Co., J. H., Athens, Ohio	420
Griffin & Co., John J., Philadelphia, Pa	76
Groble Gas Regulator Co., Anderson, Ind	54, 55
Guardian Gas Appliance Co., Cleveland, Ohio	321, 322
Harper-Wyman Mfg. Co., Chicago, Ill	16
Hays Mfg. Co., Erie, Pa	224
Helme & McIlhenny, Philadelphia, Pa	80
Hoffman Heater Co., Louisville, Ky	332
Hoffman Specialty Co., Inc., New York, N. Y.	429
Holmes & Co., Ltd., W. C., Huddersfield, England	48
Home Incinerator Co., Milwaukee, Wis	123
Homestead Heater Co., Newark, N. J	421
Hotstream Heater Co., Cleveland, Ohio	204
Humphrey Co., Kalamazoo, Mich	328, 329
Hunt Co., C. W., West New Brighton, N. Y.	252
Hurley Machine Co., Chicago, Ill	439

Name and Address	Booth
Kee Lox Mfg. Co., New York, N. Y.	354
Kernit Incinerator Co., Ampere, N. J	411
Kitson Co., Philadelphia, Pa	6
Klimatic Clothes Dryer Corp., New York, N. Y.	448
Kompak Co., New Brunswick, N. J	337
Koppers Construction Co., Pittsburgh, Pa	38
Ko-Ray Corp., Chicago, Ill	
Lambert Meter Co., Brooklyn, N. Y.	75
Lamneck Co., W. E., Columbus, Ohio	450
Lattimer-Stevens Co., Columbus, Ohio	84
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa	382
Lavino & Co., E. J., Philadelphia, Pa	56
Lawson Mfg. Co., Pittsburgh, Pa	133
Linde Air Products Co., New York, N. Y.	136
Lindemann & Hoverson Co., A. J., Milwaukee, Wis.	207
Lovekin Water Heater Co., Philadelphia, Pa	119
MacGregor Valve Co., St. Louis, Mo	256
Magee Sales Co., Boston, Mass	427
Majestic Mfg. Co., St. Louis, Mo	103
Maryland Meter Works, Baltimore, Md	83
McDonald & Co., D., Albany, N. Y.	81
McWane Cast Iron Pipe Co., Birmingham, Ala	126
Mears-Kane-Ofeldt, Inc., Philadelphia, Pa	102
Merco Nordstrom Valve Co., Inc., New York, N. Y.	73, 74
Metric Metal Works, Erie, Pa	77, 78
Methudy Enamel Range Co., East St. Louis, Ill	336



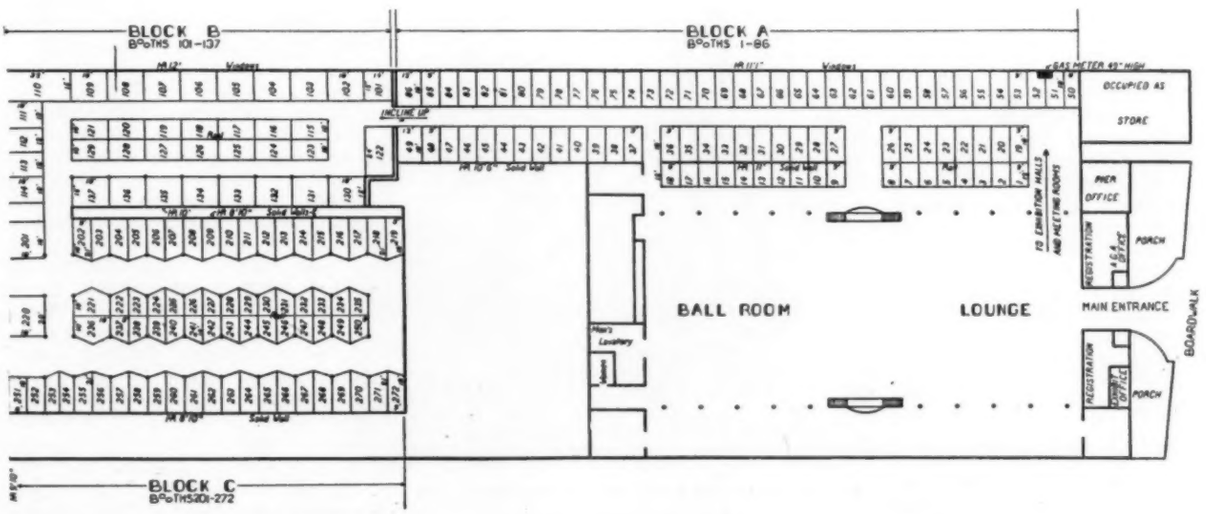
Plan, Exhibition Hall, A. G. A. Convention.

Name and Address	Booth
Improved Equipment Co., New York, N. Y.	221
International Business Machines Corp., New York, N. Y.	357, 358
Dayton Scale Co. Division.	
International Time Recording Co. Division.	
Tabulating Machine Co. Division.	
International Combustion Engrg. Corp., New York, N. Y.	422
Combustion Engineering Corp.	
Dry Quenching Equipment Corp.	
International Coal Carbonization Co.	
Lewis Mfg. Co., F. J.	
Ironton Stove & Mfg. Co., Ironton, Ohio	326
Isbell-Porter Co., Newark, N. J	40
J. & G. Brass Co., Inc., South River, N. J	17
Johnson Gas Appliance Co., Cedar Rapids, Iowa	424
Johns-Manville Corp., New York, N. Y.	377, 378

Name and Address	Booth
Mid-West Incinerator Corp., Chicago, Ill	4
Milwaukee Gas Specialty Co., Milwaukee, Wis	379
Mine Safety Appliances Co., Pittsburgh, Pa	42
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.	375, 376
Moore Bros. Co., Joliet, Ill	315
Mueller Co., Decatur, Ill	43, 44
Mueller Furnace Co., L. J., Milwaukee, Wis	129
Mulcare Engineering Co., Inc., New York, N. Y.	451
National Cash Register Co., Dayton, Ohio	364, 365
National Lead Co., New York, N. Y.	5
National Refrigerating Co., New Haven, Conn	412, 413
National Tube Co., Pittsburgh, Pa	31-36
New Process Stove Co., Cleveland, Ohio	392, 393
Odin Stove Mfg. Co., Erie, Pa	238
Ohio Foundry & Mfg. Co., Steubenville, Ohio	303, 304

Name and Address	Booth
Parsons Co., Newton, Iowa	236
Patrol Valve Co., Cleveland, Ohio	320
Peerless Heater Co., Boyerton, Ohio	112
Peninsular Stove Co., Detroit, Mich	449
Perfection Diaphragm Co., Inc., Brooklyn, N. Y.	7
Permutit Co., New York, N. Y.	128
Pittsburgh Water Heater Co., Pittsburgh, Pa.	334, 335
Pittsburgh Equitable Meter Co., Pittsburgh, Pa.	25, 26
Porcelain Enamel & Mfg. Co., Baltimore, Md.	443
Proudfit Loose Leaf Co., Grand Rapids, Mich.	363
Public Service Electric & Gas Co., Newark, N. J.	300
Pyrometer Instrument Co., New York, N. Y.	206
Quick Meal Stove Co., St. Louis, Mo.	388, 389
Reliable Stove Co., Cleveland, Ohio	394, 423
Remington Rand Business Service, Inc., Buffalo, N. Y.	372, 373, 374
Baker Vawter Division.	
Dalton Adding Machine Division.	
Kalamazoo Loose Leaf Binder Division.	
Library Bureau Division.	
Powers Accounting Machine Division.	
Rand Kardex Division.	
Remington Typewriter Division.	
Safe Cabinet Division.	
Reynolds Gas Regulator Co., Anderson, Ind.	121
Richmond Radiator Co., Philadelphia, Pa.	125
Riter-Conley Co., New York, N. Y.	437A
Robbins Publishing Co., Inc., New York, N. Y.	3
Roberts Brass Mfg. Co., Detroit, Mich.	302
Roberts Gas Burner Corp., Buffalo, N. Y.	202

Name and Address	Booth
Smith Mfg. Co., A. P., East Orange, N. J.	8
Spencer Thermostat Co., Cambridge, Mass.	113
Sprague Meter Co., Bridgeport, Conn.	63, 64
Stacey Bros. Gas Construction Co., Cincinnati, O.	85
Stacey Mfg. Co., Cincinnati, Ohio	27
Standard Gas Equipment Corp., New York, N. Y.	109, 110, 111
Acorn Division.	
Oriole Division.	
Triplex Division.	
Vulcan Division.	
Stationers Loose Leaf Co., Milwaukee, Wis.	353
Sterling Range & Furnace Corp., Rochester, N. Y.	414
Sturtevant Co., B. F., Hyde Park (Boston), Mass.	435
Superior Mfg. Co., Carnegie, Pa.	131
Superior Meter Co., Brooklyn, N. Y.	9
Surface Combustion Co., Toledo, Ohio	137
Sweet & Doyle Foundry & Machine Co., Troy, N. Y.	441
Tappan Stove Co., Mansfield, Ohio	430, 431, 432
Thatcher Co., Newark, N. J.	237
Time-O-Stat Corp., Milwaukee, Wis.	380, 381
Tinnerman Stove & Range Co., Cleveland, Ohio	436
Titeflex Metal Hose Co., Newark, N. J.	301
Troop Water Heater Co., Pittsburgh, Pa.	11
Tufts Meter Works, Nathaniel, Boston, Mass.	82
Tyler Co., W. S., Cleveland, Ohio	130
United Engineers & Constructors, Inc., Philadelphia, Pa.	401, 402, 403
U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.	19
Utilities Publication Co., Chicago, Ill.	223
Victaulic Co. of America, New York, N. Y.	24



Young's Million Dollar Pier, Atlantic City.

Roberts & Mander Stove Co., Philadelphia, Pa.	327
Robertshaw Thermostat Co., Youngwood, Pa.	305, 306
Robins Conveying Belt Co., New York, N. Y.	225, 226
Roots Co., P. H. & F. M., Rockford, Ill.	71, 72
Ruud Mfg. Co., Pittsburgh, Pa.	349, 350
Safety Gas Lighter Co., Lynn, Mass.	67
Safety Gas Main Stopper Co., Brooklyn, N. Y.	52
Sands Mfg. Co., Cleveland, Ohio	338
Scientific Heater Co., Cleveland, Ohio	116
Semet-Solvay Engineering Corp., New York, N. Y.	70
Servel Sales, Inc., New York, N. Y.	404, 405, 406
Shallcross Control Systems Co., Milwaukee, Wis.	255
Sherwin-Williams Co., Cleveland, Ohio	2
Slattery & Bro., Inc., J. B., Brooklyn, N. Y.	410
Wailes Dove-Hermiston Corp., New York, N. Y.	29, 30
Walker & Pratt Mfg. Co., Boston, Mass.	330
Welsbach Co., Gloucester, N. J.	316, 317
Western Gas Construction Co., Fort Wayne, Ind.	39
West Gas Improvement Co., New York, N. Y.	47
Wilcolator Co., Newark, N. J.	341
Wilder Metal Co., Niles, Ohio	309
Wise Furnace Co., Akron, Ohio	442
W-K-M Co., Houston, Texas	22, 23, 24
Wood & Co., R. D., Philadelphia, Pa.	49
Youngstown Pressed Steel Co., Warren, Ohio	318

Plan to Attend the A.G.A. Convention

Technical and General MISCELLANY for The Busy Gas Man

PURIFICATION OF GAS

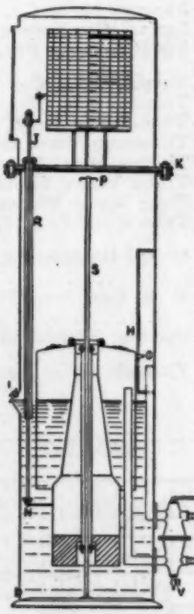
The various impurities in gas are discussed under the headings of suspended tarry matter, ammonia, sulphur compounds other than sulphuretted hydrogen and sulphuretted hydrogen. The manner of the removal of these impurities is described. Considerable detail is given on the manner of operating the purifying plant and on certain alterations that were made in the operation of the purifiers to obtain increased efficiency.

The boxes are arranged so that they are adjacent and one side of one particular box is the side of the next one. A tremendous increase in area was thus gained. The control of the purifiers is provided for by a twenty-four-inch connectionless center valve which allows of the downward flow of gas. The four boxes are arranged in such a fashion that it is always possible to use all of them at the same time, or to by-pass any one of them. The boxes are provided with two tiers of horizontal grids, and the oxide is discharged at the bottom of the boxes on to the revivifying floor below. After revivifying, the oxide is conveyed by electrically driven plant from the basement by way of an elevator outside the building, which delivers the oxide to a belt conveyor running down the center inside the house. A suitable throw-off carriage and chute complete the handling of the material. L. G. Slack, Gas Journal (London), June 6, 1928, pages 669-672.

MEASUREMENT OF GAS

The necessity of measuring accurately the volume of gas that is obtained in the retort house is becoming more and more recognized to be a matter of great importance in controlling the gas-making process. But there has been a difficulty connected with this operation due to the fact that the gas must be measured in the unpurified state. An apparatus which permits this to be done is shown in the accompanying illustration.

The meter is of the inferential type, which means that the entire volume of gas is not passed through it, as in the drum type of station meter, but the volume of gas passing in the main is inferred from the difference in the pressure on two sides of a tube or orifice inserted across the main. Inside the body of the meter is a specially constructed float G which swims in water



and is subject to pressures above and below, which are communicated through the cocks R_1, and R_2. According to the difference in the two pressures the float takes up a certain position. To the top of the float and without any gearing of any sort, is connected a rigid pen arm J surmounted by a short pen gear and an inked pen. The precise travel of the float is thus recorded on a clock-driven chart usually calibrated in terms of cubic feet of gas per hour. The two pressures admitted to the recorder are obtained by inserting a pilot tube (or throttle disc or other differential device) in the gas main, from which connections are taken to the recorder by means of a three-quarter-inch gas piping. The connections may be as long as 300 feet on most applications without affecting the efficiency and accuracy of the recorder. West's Gas, April, 1928, page 7.

TEMPERATURE CONTROL IN JAPANNING OVENS

Many japanning ovens are operated with gaseous fuel and the ease with which this fuel is thermostatically controlled is an important factor in the modern operation of the japanning plant. for the quality of the japanning is dependent to a large degree on the maintenance of the temperature at the proper point. This can be readily accomplished by using a temperature controller. It has also been found advisable to use a recording thermometer as well to obtain a complete picture of the entire japanning operation. The importance of the temperature in the japanning operation, if good results are to be obtained, that is the proper color effect, a well-baked product, free from brush marks, dirt and the like, makes it necessary for the gas engineer to advocate control if the proper results are to be obtained from his fuel. W. J. Miskella, Fuels and Furnaces, March, 1928, pages 161-2.

UNSATURATED GASES IN COAL GAS

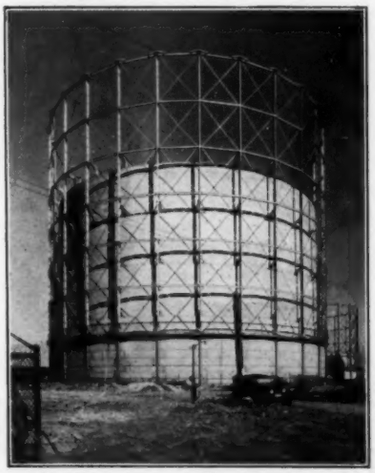
Ethylene, propylene and butylene are determined in a coal gas by passing a known volume (about ten cubic feet) of the gas through bromine, after a preliminary oil scrubbing to remove the vapors of volatile liquids. The bromine compounds of the unsaturated gases are distilled under reduced pressure and the olefines are regenerated by the action of a zinc-copper couple on a weighed quantity, about two grams, of the distillate in solution in 95 per cent alcohol. The olefines in the gas so obtained are determined by absorption of the propylene and butylene in 87 per cent sulphuric acid, making a correction for the small concurrent ethylene absorption, followed by absorption of the ethylene in fuming sulphuric acid. A second method consists in the combustion of a second portion of the gas over copper oxide and measurement of the carbon dioxide produced.

It is then possible to calculate the ethylene, propylene, and butylene content of the original gas. By extraction of the residue from the distillation of the bromine compounds with alcohol, the butadiene tetrabromide present can be isolated and thence an approximate value of the butadiene content of the gas obtained. A typical low-temperature coal gas contained ethylene 1.18%, propylene 1.16%, butylene 0.68%, butadiene 0.15%; a high-temperature, horizontal retort gas contained ethylene 1.90%, propylene 0.28%, butylene 0.68%, butadiene 0.02%. Results for other types of gases, including a series produced by the carbonization of coal at temperatures from 400° to 700° (cf. Sinnatt, King, and Linnell, J.S.C.I., 1926, 45, 385 T), are given and briefly discussed. (Journal of the Society of Chemical Industry, March 30, 1928).

SIMULTANEOUS PURIFICATION OF GAS FROM AMMONIA AND SULPHURETTED HYDROGEN

The Burkheiser process with its latest developments, the Walter Feld process and a new catalytic process are discussed. The principle underlying the catalytic process is to oxidize the sulphuretted hydrogen in the crude gas by catalysis. The crude gas was to be mixed with required quantity of oxygen or air and passed over a catalyst, where-

ENGINEERS *and* BUILDERS GAS HOLDERS *and* TANKS



Gas holders are capital investments and holders by Stacey Bros. assure a long life for that investment. It is real economy to buy Stacey Bros. Holders and they can be supplied in any capacity.

The illustration at left shows the ten million cubic foot holder erected in Buffalo, N. Y., in record time, and a duplicate erected in Long Beach, Cal., eclipsing record made in Buffalo, which prove conclusively our

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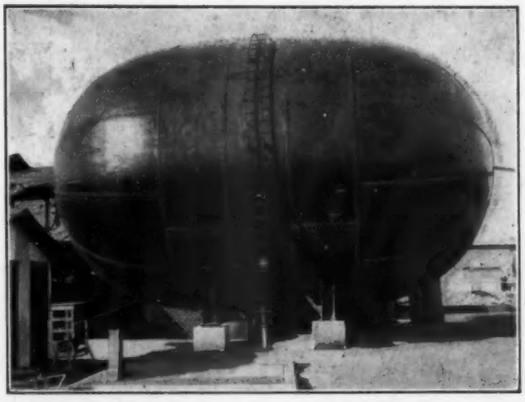
STACEY BULLET

A pressure holder of unlimited capacity, unsurpassed for sound engineering and designed to eliminate faults inherent in other types.



PURIFIERS

Designed on a conservative basis and users are assured cheap operation and maintenance. The capacity is calculated to purify gas at a minimum of cost.

STACEY BROTHERS GAS CONSTRUCTION COMPANY

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WAYNE STACEY, Gen. Sales Mgr. P. C. RODGERS, Asst. Sales Mgr.

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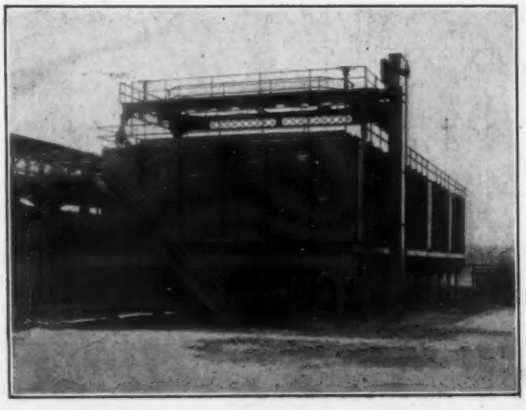

Your Gas Market is *Unlimited*

Everywhere **gas sales are possible with Clow Gasteam Radiators. Any place—from the Gulf to the Great Lakes. Any job—from a huge warehouse to a tiny suburban station—or a private home—or any job.**

Look at the installations right here! Twenty-six of them—all different—every type of climate—all Clow Gasteam equipped. (Illustrations are of more unusual jobs—private homes, etc., are not shown here.)

Clow Gasteam Radiators handle dry Texas weather just as efficiently as they perform in Illinois or Massachusetts. In any place, in any climate, they can mean gas sales for you.

And Gas Companies should remember this: Because Gasteam is on so many different jobs, Gas-

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CLOW GASTEAM

A. G. A. and Underwriters' Laboratories Approved

STOCKED IN EVERY SECTION OF THE COUNTRY

with CLOW GASTEAM!

team *steadily* raises your heating load.

The domestic need for heat is largely after the commercial need is over for the day. Churches and Theatres using Gasteam can raise your Sunday "valleys."

You're missing something if you're not pushing Clow Gasteam—missing money-making sales—missing money-making gas loads.

Get information on Clow Gasteam Radiators right away. Write today for our new book.

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Boston, Mass.	Louisville, Ky.
Brooklyn, N.Y.	New Orleans, La.
Buffalo, N.Y.	New York City
Charleston, W.Va.	Oakland, Calif.
Chicago, Ill.	Oklahoma City
Cincinnati, O.	Parkersburg, WVa.
Clarksburg, W.Va.	Pasadena, Calif.
Cleveland, O.	Philadelphia, Pa.
Columbus, O.	Pittsburgh, Pa.
Dallas, Texas	St. Louis, Mo.
Denver, Colo.	San Antonio, Tex.
Detroit, Mich.	San Diego, Calif.
Ft. Worth, Texas	San Francisco
Fresno, Calif.	Santa Barbara
Houston, Texas	Shreveport, La.
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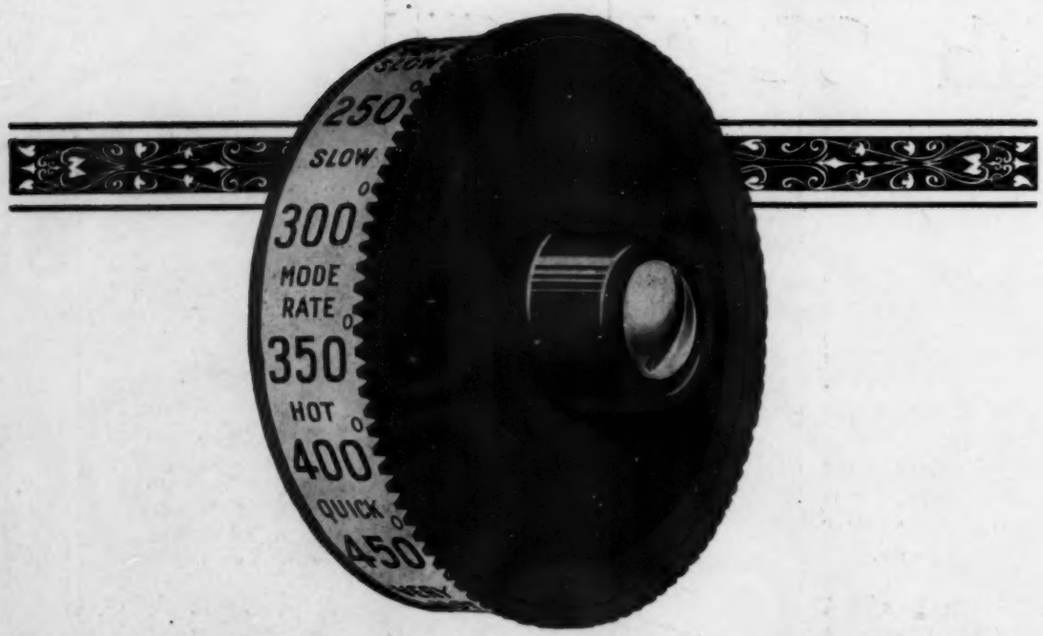


"If You Want to be a Leader of the People You Must Watch Events"—OLD PROVERB

The September 22nd Issue of The Saturday Evening Post will contain a Two-page, Two-color Advertisement of Red Wheel Gas Ranges—Circulation, this issue, 2,845,568.

Red Wheel advertisements in Collier's, Liberty, Delineator, Good Housekeeping and Pictorial Review will add 8,202,316 more Circulation to the September campaign.

AMERICAN STOVE COMPANY
1022 Chouteau Avenue .. .. *St. Louis, Mo.*
LARGEST MAKERS OF GAS RANGES IN THE WORLD

These are the Six Famous Brands of Red Wheel Gas Ranges:
DANGLER · CLARK JEWEL · QUICK MEAL · DIRECT ACTION · NEW PROCESS · RELIABLE

LORAIN RED WHEEL

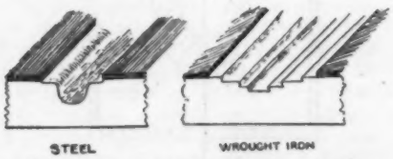
by the sulphuretted hydrogen would be directly converted into sulphur dioxide. Then the sulphur dioxide would combine with the ammonia in the gas to form ammonium sulphite. The bulk of this sulphite was to fall down in crystals and the remainder, carried forward by the gas, to be removed by an electric filter. The sulphite would thus be wholly recovered as a crystalline powder.

Difficulties occurred in completely catalyzing one per cent of sulphuretted hydrogen in the gas. These difficulties have, however, been overcome and today the sulphite obtained in the operation is white and nearly dry and contains 22.3 to 22.0 per cent of nitrogen. The catalysis has no effect upon ammonia or benzol. The cyanogen is mostly converted into ammonia. The life of the catalyst is very good. A slight excess of sulphuretted hydrogen is always necessary in order to provide sulphur dioxide to take up any ammonia liberated by the slight tendency of ammonium sulphite to dissociate. If there is excess ammonia in the crude gas part of this is to be retained as concentrated liquor.

In one plant that works on this process, the foul gas enters at a temperature of 100 degrees C. Cooling down to 20 or 25 degrees C. separated the liquor and the tars. The liquor was boiled so as to volatilize the sulphuretted hydrogen and the ammonia. Meanwhile the gas stream was electro-filtered for tar fog, and then, after the sulphuretted hydrogen and the ammonia from the liquor had been added to it, warmed up by the heat from the catalyzer, temperature regulators being employed. The gas stream then goes to the catalyzer which tends to heat it up, but the heat is partially taken up by the succeeding portion of the gas stream, passing in counterflow. At this stage, the catalyzed gas stream contains the vapor of ammonium sulphite, but on further cooling, the sulphite is deposited. A final washing of the gas stream removes any excess of sulphur dioxide. The gas then passes on free from sulphuretted hydrogen and ammonia. Dr. Hans Bahr, Das Gas and Wasserfach, year 1928, pages 169 to 173, and 204 to 210.

CORROSION OF WROUGHT IRON IN RELATION TO THAT OF STEEL

Some very interesting experiments were carried out to determine the relative corrosion of wrought iron and steel, a problem which is of considerable importance to the gas engineer. In one series of tests the corrosive effect was produced by dropping acid on the samples and allowing it to effect its action in the presence of air. The behavior of wrought iron exposed to the atmosphere was also investigated. The effect of water or salt solution on wrought iron and corrosion by neutral waters or solutions in the presence of stray electric currents were also investigated.



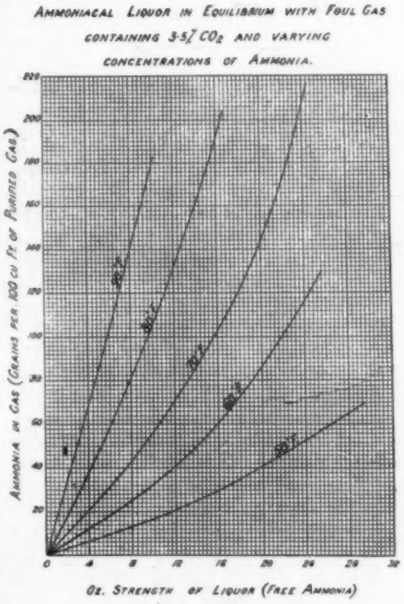
STEEL WROUGHT IRON

It was first found that as far as hydrogen-evolution type of corrosion was involved, different strata of wrought iron behave differently, the most attackable portion being in the middle and the least attackable on the outside. When once the attack reaches the interior portions, wrought iron is very quickly attacked by dilute acids. As far as corrosion of the oxygen-evolution type is concerned, steel is attacked a trifle more quickly than wrought iron, but the difference is slight, and would usually not justify the adoption of wrought iron under conditions where the corrosion is likely to be of a uniformly distributed character.

Corrosion in service is usually only serious if conditions cause it to be localized on a limited number of small areas. This may occur for instance in the attack on buried metal work or pipes by stray electric currents, the attack being concentrated at a few points where the tar or bituminous coating is imperfect. Here wrought iron will usually have an advantage. This does not mean that it corrodes more slowly; assuming the same strength of stray current in both cases and sufficient chloride in the soil to prevent passivity, both materials will suffer approximately the same total corrosion. The advantage of wrought iron is that it corrodes differently, the attack tending to extend sideways to some extent, while on steel it burrows downwards, leading to rapid perforation. This difference between the ways the two meals corrode is clearly shown in the accompanying illustration. U. R. Evans, Journal of the Society of Chemical Industry, 1928, pages 62 to 69T.

SOME APPLICATIONS OF CHEMISTRY TO GAS MAKING

Various important subjects are discussed such as quality of tar, effect of increased charges, analysis of light oil, etc., pertaining to the carbonization of coal. Certain work carried out on an experimental carbonizing plant is described. Attention is paid to the pressure conditions within the retort and to the use of the waste heat boiler as a gas meter. The production of gas in steamed vertical retorts is also described and the working results are analyzed.


Ammoniacal Liquor in Equilibrium with Foul Gas containing 3.5% CO_2 and varying concentrations of Ammonia.
Ammonia in Gas (Grains per 100 cu. ft. of Purified Gas)
Oz. Strength of Liquor (Free Ammonia)

Particular attention is paid to ammonia recovery. Quantitative information on ammonia washing was collected. The results of the work along these lines are contained in the curve sheet (see accompanying illustration). Each of the curves shows the relationship between the "free" ammonia content of liquor in equilibrium with gas of a given ammonia concentration at a definite temperature. It should be explained that, in this case, the gas was derived from a vertical retort plant, and that it contains about 3.5 per cent of carbon dioxide.

A study of these curves emphasizes the importance of thoroughly cooling the gas at the inlet to the ammonia washing plant, since, for example, washing gas with a liquor containing "free" ammonia equivalent to two ounces strength would reduce the ammonia content of the gas to six grains per hundred cubic feet at 60 degrees F., but only to 34 grains per hundred cubic feet at 90 degrees F.

The following tabulation gives the theoretical quantities of water in gallons

Ammonia in Gas Entering Washers (Grains Per 100 Cubic Feet)

Temperature	100 Gallons	120 Gallons	140 Gallons	160 Gallons	180 Gallons
60 degrees F.....	4.5	4.9	5.2	5.6	...
70 degrees F.....	6.4	6.7	7.1	7.5	8.0
80 degrees F.....	10.4	10.7	11.4	11.4	11.8
90 degrees F.....	17.0	17.2	17.5	17.8	18.0

per ton of coal which it would be necessary to use for the complete extraction of ammonia from coal gas containing 3.5 per cent of carbon dioxide at different temperatures, and for different concentrations of ammonia in the gas entering the washing system. It is assumed that the yield of gas is equivalent to 15,200 cubic feet per ton of coal. —H. Hollings, The Gas World, 1928, pages 668 to 679.

NOTES ON A BRITISH DISTRIBUTION SYSTEM

The system which is described in great detail is in use in the Tottenham district in England. Various points in that system are of interest to the American distribution engineer. Thus, figure 1 shows at (A) a typical section of the trench required for the 48-inch main when laying at normal depth and in good dry ground. When difficulty arose due to water in the trenches, the latter were timbered in the manner shown at (B) in figure 1.

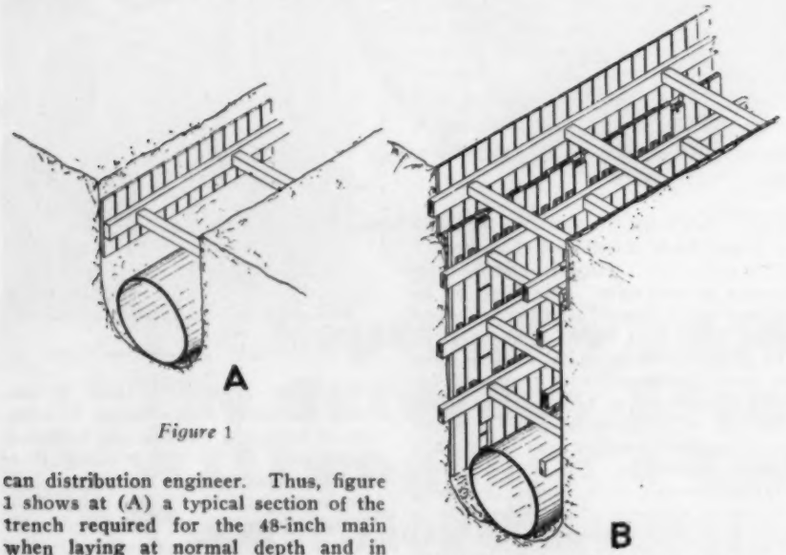


Figure 1

A portion of the main had to be laid on a road which was chocked with traffic. Hence, instead of closing a part of the road, a heading was driven 60 feet in length from both sides of the road simultaneously. This heading was 7 feet 6 inches square in cross-section and was timbered as follows: Half timbers of pitch pine were used for the side trees and the head trees, and poling boards for the roof and sides. A six-inch concrete floor was placed in the bottom of the heading and the pipes were laid on six-inch wooden packings. The heading was then filled in with clay to a height of 12 inches above the main, and weak concrete was filled and rammed into the remaining spaces between the surface of the clay and the underside of the roof.

The quantity of lead used in each joint on the cast iron main weighed 118 pounds and each joint was tested separately under an air pressure of 30 lbs. per square inch. The testing apparatus is shown in figure 2. It is made of three pieces of steel, two flanged pieces and one center piece. Two specially constructed lobes are provided and are inflated and make a joint with the pipe to be tested. The pressure is applied to the space between the tubes by means of either air or a fluid.—H. C. Smith, The Gas World, pages 643 to 658, year 1928.

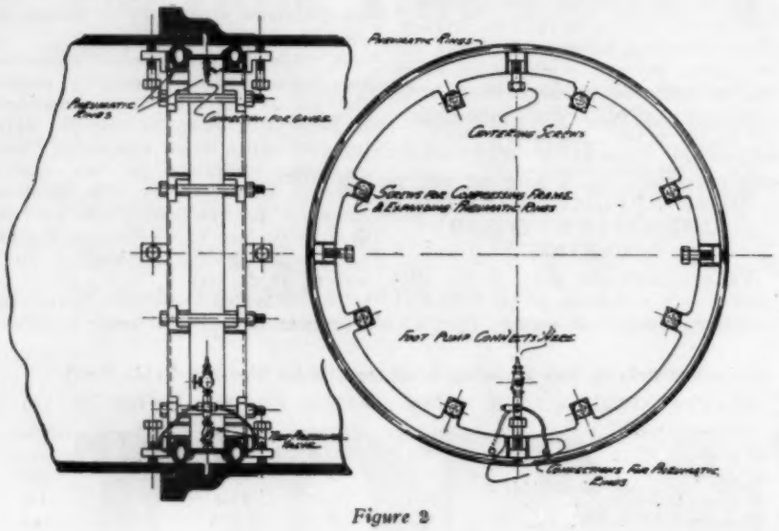
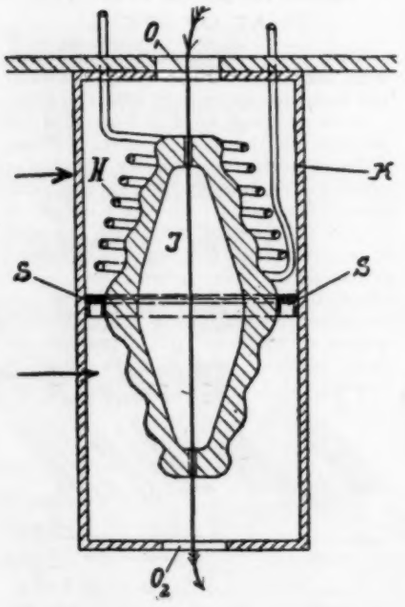
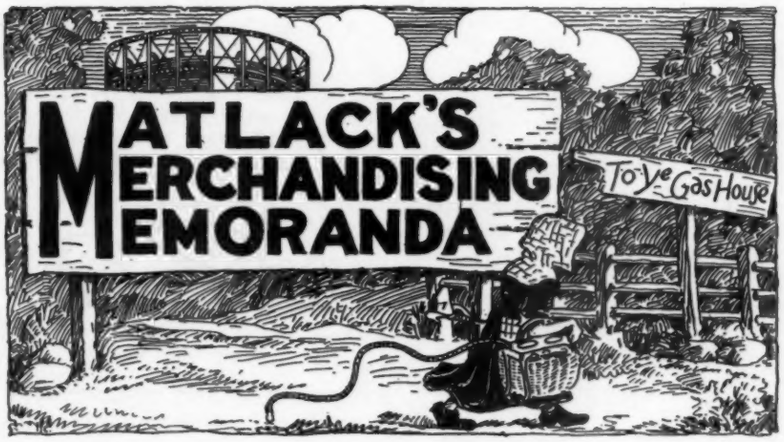


Figure 2

ELECTRICAL PURIFICATION OF GAS

The illustration shows a type of electrical purifier used in precipitating the tar particles in gas. The insulator is shown at (I), this insulator being arranged in the housing (K), which possesses two openings (O_1) and (O_2), through which the high voltage lines are led. The ring (S) is used to close the gas space gas-tight, this ring being placed around the insulator (I). The horizontal arrows indicate the passage of the gas through the apparatus. In order that the temperature equilibrium between the two parts of the insulator is maintained constant with sufficient degree of accuracy in this arrangement, a heating coil (H) is arranged in that part of the housing which lies nearest to the external wall.—Elektrische Gasreinigungs G.m.b.H. German Patent No. 460,072.





CUE AND BARBECUE

Some gas men say that to open up the fall selling season it is a good idea to put over an intensive drive on ranges. These men state they intend to depart from the horrible sacrifice type of sale and employ the "what-it-will-do-for-you" idea in putting over their range sales.

One man says he is going to cash-in on the roadside barbecue stand's summer efforts and push a special range advertising it as the range that will permit the customer who has developed a taste for barbecued meats, fish or fowl to have it all winter in his own home. This man claims that he will put this sale over big for he is going to insist that his salesmen get the barbecue idea into every home in his city. He plans to exploit the idea through every known advertising channel.

PROPER BAIT

Small appliances help materially in building up the per meter sales. With the coming of cold water, there are a number of appliances that the gas man can well afford to push, advertise and display; the cake griddle, the toaster and the waffle iron are all good items and all help to sell more gas per meter. Cake pans are also a good item. We know of a midland gas company that has sold a great many of these appliances during the year 1928, and in talking to the manager of the company, the other day he said: "We have had larger increases per meter this year than at any other time during the past five years, and you will not believe me when I tell you that I attribute this largely to the fact that during the past eight months, we have sold more appliances than we ever did in the history of the company. We have made the selling of such items as aluminum cake pans, toasters, percolators, waffle irons and other small appliances a habit on our floor and we now sell a world of them."

We know of another man who decided to feature small appliances at a low price to attract women to his store in order that they might see the new ranges, water heaters, refrigerators, etc., that

he displayed. The last time we talked to him, he was well pleased with results, saying that he had been able to trace a number of sales of major appliances to the fact that he had offered the home manager a well known brand of aluminum cake pans at a very attractive price.

THE OLD SUBJECT AGAIN

We were talking dealer co-operation with a gas man the other day when he said: "Well, I am of the opinion that the gas industry is at last working along the right lines and I am sure we will see some mighty big things happen within the next twelve months. You know, as I see it, heretofore the gas man has raised a lot of h—— about dealers selling cheap and inferior appliances and about the prices and terms he offered, but he really has done nothing to show the dealer the fallacy of such a plan. Instead, he has decided that 'they can't get away with that' and devised a premium or cut price sale that he might discredit the dealer.

"Now, tactics of that sort have done us no good and instead of becoming real merchandisers, we have become gift artists; we can not sell an appliance unless we give away a set of dishes, an allowance for an old stove, a kitchen table or a special discount.

"The public is getting wise to these plans and not only hold off until we have a special sale, but have come to expect a gift or two whenever they make a purchase in our stores. As we plan it, we will handle and offer for sale only the very best merchandise we can possibly obtain and we will sell it on a plan that the dealer may tie into, that is, we will not stretch our terms out over 18 to 24 months; we will secure a substantial down payment, we will have no free trials, and we will have no premiums. We are going to have a fair mark-up, one that will enable us to stand on our own feet and we are going to go to the dealer and tell him of our plans.

"In that way we believe we can secure the cooperation of all the worthwhile dealers in town and in a big way increase our sales of gas. That, we say, is the only reason we sell merchandise and now we are going to show the dealer that we are sincere about it."

BEING UP-TO-DATE

Bishop of show card fame tells us that the modernistic gas man seems to be in the majority, judging from the way he is taking to modernistic show and window cards and window display advertising. It's the mode, and gas men may well remember the old rhyme: "Oh cruel, cruel fate, you might as well be off the earth, as not be up-to-date."

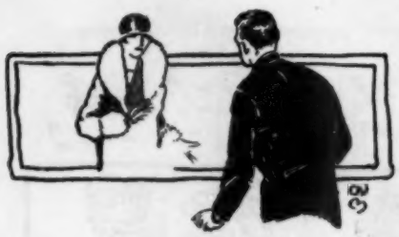
INTO THE DISCARD

Oh, the stuff in the basket! That's just some junk that would not pass the Lab, that we are going to junk; tubing that smells bad, a poorly constructed hot plate and such and such. There's no reason to sell junk, regardless of all this talk about over production going to bring lower prices. Gas men who cut and slash now and sell cheap-John appliances are going along the line of least resistance.

SELLING DRYERS

Jim Trainer sent out a questionnaire a few weeks ago in which he asked: "Do you think the clothes dryer is hard to sell?", and we understand he expected that 99 44/100% of the answers would be: "Yes." We also expect he was going to tell the boys how to do it, but the returns did not come in on that basis. Nearly everybody said, "No".

Now, what we would like to know is, how they do it, these boys who say "no". It has always been our opinion that it could be done in this way. Give it special treatment; employ a man to specialize on the home laundry, the washer, the ironer, the laundry stove and the dryer and do nothing else, and it can be done in a big way.



Merely placing a laundry dryer on the display floor with a price tag on it will not sell very many dryers, but if a specialist is given the job of selling it and he sees to it that it is given a little advertising and is displayed and demonstrated on the sales floor, you may count on it that the sale of dryers will look up.

When you find an item on your floor that is not moving, ask yourself this question: "Are customers approached to buy this item?" You'll be surprised how little effort is made by the average floor salesman to sell.

A GOOD TIP

With vacation over and cool weather approaching, it is time to give some thought to brushing up employee sales organizations.

Each and every employee of the gas company should be interested in the sale of merchandise, and they will be if some one in the sales department will take the time and trouble to interest them. As we view it, this job is up to the sales manager.

One company that we know of uses an employee list and whenever a new item of merchandise is stocked, whenever there is a special drive or a new low price, the employee is mailed a bulletin or some descriptive matter, in order that he may become acquainted with what the sales department is pushing. Aside from this, a bulletin board has been erected at the shop, office and

in the store room, where these bulletins as well as all advertisements are posted for the information of employees.

SELLING FIRE-PLACE HEATERS

September is the month that the gas man should hammer home the idea of the fire-place beautiful. Don't sell gas heaters—sell the fire-place beautiful.

Folks are willing to pay real money for beauty and comfort and we know of no other appliance that offers both, and in such a wonderful array of designs and colors. To-day, the old excuse, "well I would like mighty well to have one of those radiant heaters but we do not have a fire-place in our home" is passe. Boy, here is your opportunity; pull out the old catalog and show him how you can provide heater and fireplace. Cash in on the National advertising the heater people are doing. You just have to hunt your bacon to bring it in, and there's lots of it, too. But you have to slip up on it. Don't try to high-pressure 'em—they've had too much of that now. Just sell them by telling them what it will do in the way of providing both comfort and beauty in their homes.

DINNER CLUBS

A gas man has advanced the idea that meetings of various kinds are being over-worked. He says: "In this day of specialization, I wonder if the gas man is not over-working the idea of luncheon clubs, special group meetings, departmental meetings and the like? I do not

know, but it seems to me that if, instead of having such a maze of meetings, covering such a conglomeration of subjects, I could represent my company as a member of one service club and devote the balance of my time to some specific phase of the business, we would all get more out of it.

As things are today, they come so fast and furious that I often wonder what it's all about and just what kind of meet I get any meat out of, if any?

AS OTHERS SEE US

Did you ever walk into the gas office in a strange town, look around and ask questions, just to ascertain what they were doing about the country?

Were you ever approached by a floor salesman who was just about "half-baked" on one or more of the different makes of ranges or water heaters the company was selling. Did he say: "Yes, we sell the Blank, the Blink and the Wink. They are all good—now the Blank has, etc., etc., but some folks like the Blink because etc., but as for me, gimme the Wink every time, because etc., etc. Yes, sure that is right. I never thought of that. That is a good feature the Blink has but, now you take the Blank. etc." Do you get the idea?

This salesman's efforts are anything but strong for any one particular appliance, and consequently, he is not selling any one of them but is spreading his attention over the three lines and in turn causing the prospective purchaser to delay decision. Undoubtedly the three heaters are all purchased with the idea that they are all efficient, yet they are most efficient when used under certain fixed conditions and it is the idea of the management that the salesman should learn from the prospective customer what his requirements are before attempting to sell him either appliance.

As gas men, we know that it is quite true, generally, that merchandise is purchased, displayed and advertised and the salesmen are given only a rudimen-

tary knowledge of the appliance, or none at all, and are expected to sell not only the appliance but a whole pack of good will with it.

It just can't be done. As a gas man you know that this is true, the selling effort is divided and the sales education of the average salesman is neglected. Of course, this does not happen in your organization, but just visit the other fellow's place and see if you don't find it more or less true. Don't take our word for it, visit around a bit.

HELP FROM THE OIL BURNER MAN

The oil burner man has been working all summer to develop some mighty good incinerator customers for you. Why not cooperate with him now and capture some of that incinerator business? If you are selling house heating just add to your list of prospects every oil burner installation you can find. They can't burn the garbage in a furnace equipped with an oil burner. Why not go to the oil burner man and get a list of his customers? You'll find he will cooperate with you if you will cooperate with him. It's just another way to build up that domestic load.

PHONE 'EM

Every sales manager has been told how folks have been brought to demonstrations by phoning them an invitation the day of the demonstration, yet it is well worth repeating. Phone folks on the day of the demonstration, tell them what the menu is to be and tell them to be sure to come. A West Virginia gas company recently sent out over seven hundred printed invitations to a demonstration and announced it in newspaper advertisements, yet when the day set for the demonstration came a service clerk and the demonstrator spent the whole morning on the phone, with the result that the crowd could not be accommodated and an extra demonstration had to be conducted the next day.

CLEARANCE SALE

A. G. Packwood, division sales manager, Illinois Power and Light Corporation, Mt. Vernon, has recently put over a Clearance Sale that will no doubt be of interest to the readers of the Memo. Having a number of carefree water heaters on hand at Mt. Vernon, Centralia, and Cairo after his summer drive, Mr. Packwood decided to use department store tactics, reduce the price and sell out the stocks on hand before the cold weather arrived. Having cut the price, it was decided that newspaper space in the dailies in the three cities would be prohibitive and that postal cards would do the trick. Accordingly the two cards reproduced below were used with the result that Packwood cleared his stock.

ILLINOIS POWER AND LIGHT SERVICE
This is $32.80 The chance you've waited for!
HOT WATER Morning, noon and night, the year 'round. Right from your faucet.
Your Choice of
Pittsburgh No. 25 Heater
Regular Price..$123.50 Coupon Value.. 32.80
Your cost, installed ..... $ 90.80
Rex No. 24 Heater
Regular Price..$108.50 Coupon Value.. 32.80
Your cost, installed ..... $ 75.70
Walker Pittsburg Heater
Regular Price..$100.30 Coupon Value.. 32.80
Your cost, installed ..... $ 69.50
Remember—Only a limited quantity. When they are gone this offer closes. Come in now, or if you wish we'll send our representative at your request
Monthly Installment at a slight additional carrying charge
THE HOME APPLIANCE STORE
Illinois Power and Light Corporation
THIS CARD is a $32.80 PAYMENT on a Limited quantity of AUTOMATIC WATER HEATERS

CAN YOU ANSWER THIS ONE?

Did it ever occur to you, gas refrigerator salesmen, that women are harder to sell the idea of gas refrigeration than men. This fact was brought to our attention recently, and while we are not quite sure that it is a fact, it does seem that the woman has far more to say than the man, and that she also has more questions to ask. One which every woman asks is, "How about moving the gas refrigerator when I wish to clean under and back of it?" We just could not see how she could do it, but we suggested that in the event she wished to redecorate we could have our service man move it for that purpose and reconnect it. This question will come up and we would like to have a better answer for it. The one thing we have to sell that goes over big with the home manager is that the gas refrigerator is noiseless, "as silent as snow." This makes a big appeal to her, for she is of the opinion that refrigerators should be seen but not heard.

A PAGE FROM THE OTHER FELLOW'S BOOK

An insurance salesman said to us the other day: "When I started out to sell insurance I had to depend entirely upon 'cold canvasses' to earn my way. I expect I worked in that manner for four or five weeks and I was beginning to think that it was too hard a game when by chance I ran across a man I had sold and in the course of our conversation he said: 'By the way, I have a friend who is talking about taking on some more insurance; why don't you look him up?' I did, and I sold him, and at the same time sold myself the idea that following up customers was an endless chain of money-making for me. I have employed the method ever since, and you can bet I no longer cold canvass."

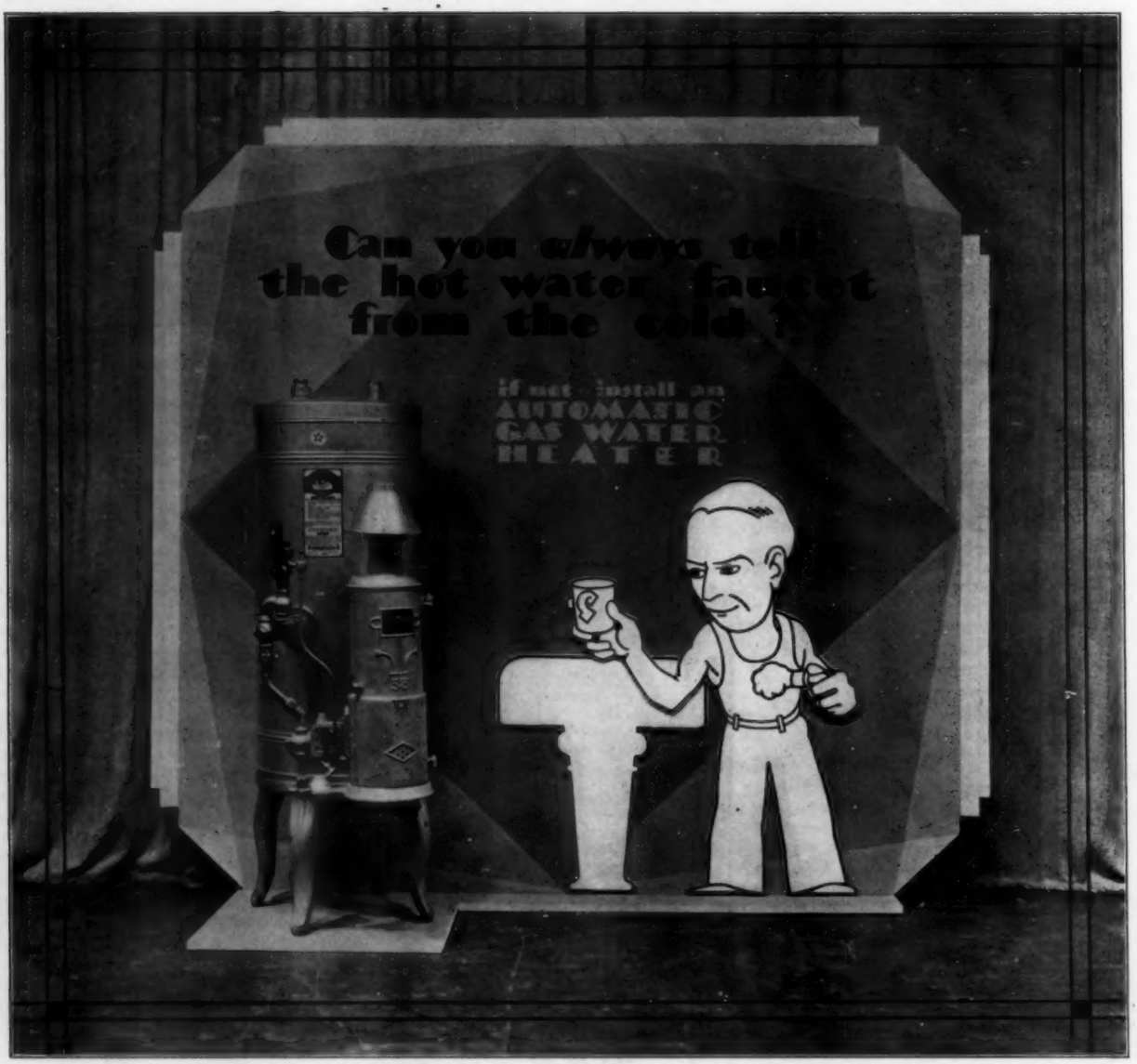
This same system may be profitably employed by the man selling home labor saving appliances.

THE OLD ORDER PASSETH

"The old order passeth"; the boy who cracks the whip at 'em and makes them jump is all out of order today. We do not quite understand what has brought the change about unless it is that more managers are managing today than heretofore.

The order of the day is to try to keep 'em happy and they will help you meet the obligation the booming, or blooming stock market has placed upon management, to make good the extra dividend.

Plan to Attend the A·G·A·Convention



Should Modernistic Art Be Allowed To Invade the Kitchen?

By Ray Martin
Chairman Window and Store Display Committee, American Gas Association

MODERNISTIC art is less suited to the kitchen than any other room in the home.

The very practical nature of all kitchen appliances immediately prohibits their association with any phase of art based upon the exaggerated lines to which modernism tends.

Why consider displaying symmetrical objects—our appliances—in an environment that is basically opposed to symmetry. Such display advertising will result only in creating a desire for appliances of modernistic appearance—regardless of the effect on their efficiency.

Primarily, the one thing we sell is the service that gas appliances render. Periodic refinements in appearance are developed only because they assist in breaking down sales resistance without interfering with efficient operation. For example, no one would think of eliminating or reducing the supply of secondary air required by a water heater in order to improve its appearance. Why, then, exhibit gas appliances in surroundings that, if generally adopted, would undoubtedly necessitate sacrificing operating efficiency for appearance.

Modern Methods in the Development of Gas Sales

By GEORGE E. WHITWELL
Manager Sales and Service, Philadelphia Company

I RECENTLY had the good fortune to listen to an extremely enlightening talk by professors at New York University; the most practical professors it has ever been my privilege to listen to. They were conducting researches in selling, actually sitting in during the negotiations between the vendor and vendee, and they have covered some fifteen thousand of these tests, and from the facts brought out from such a vast study, have set down certain principles, representing the most advanced thought in modern methods.

There were six principles of selling brought out in this talk.

The first principle is, if you want to win a business argument, do not talk too much.

The second principle is, if you want to win a business argument, do not interrupt. We have all had the experience with somebody making a statement and it was on the tip of our tongue to come back with a hed hot answer. The better way is do not interrupt.

Don't Argue

The third principle is, do not argue. An illustration was given during this talk with one man acting as the salesman and another as the customer. The illustration brought home forcibly the fact that when the argument started, both men talked for forty-five minutes, and never got back to the subject on which they started.

The fourth principle is, if you want to win a business argument, find out what the other man's objections are. Perhaps you spend a lot of time selling him something he is already sold on and too little time on things that are important. In that event, the first thing you know your time is up, nothing has been accomplished, and a sale probably lost.

The fifth principle is, see that any objection that the customer offers is repeated in your own words, so that he may understand that you understand his objection. Put yourself in the place of the customer for a moment. You believe firmly in this objection of yours. You make this objection to the salesman, and this objection to you is most important. The reaction of the customer is surely inspired by this tremendous objection, and this must be removed before you can go ahead.

Repeat the objection of the customer so that he may know you understand, and finally, try to concentrate on overcoming the customer's objection.

The extent of all of these things is knowledge, knowledge of that which you must sell and it is for that reason, that you find engineers and more engineers in the sales end of the business. It requires knowledge. With knowledge, you won't talk too much, because generally, when too much time is being taken, it is due to the fact that you are trying to cover up your own lack of knowledge.

Now, gentlemen, why do we sell? We are a monopoly. If you don't believe it, read the newspapers for the last few months. Lots of people think we are a monopoly. Why do we have to sell? Why, in our Company, that is in the electric, steam heating and gas business, there are in my department, trying to sell, almost 400 employes? It is true we are a monopoly. A regulated monopoly. I think we all believe, and most of the public, that we are a regulated monopoly.

Our business is just as competitive as that of any corporation. Take the industrial field as an illustration. The industrial field is one in which the engineers are doing such good work. Take these men that go out to sell our form of heat to the customer. That customer will buy our form of heat only if he knows that in purchasing it, he will be able to produce a first quality product for less expense than he can with some other fuel.

Qualifications

The industrial engineers must have more knowledge than any in the business, they must know about the heat problems, they must answer any questions in their business; otherwise they will not have that knowledge which is essential.

There isn't a Greek in Pittsburgh, running a restaurant, that will use gas to cook with, if he doesn't get something that makes money for him, and finally, we get to the domestic consumer, and there the situation is perhaps a little bit more obscure, but why should the domestic consumer buy an incinerator which will help make additional load, unless we make an appeal to that customer so that he is willing to spend his money for that particular piece of equipment rather than for some other thing he is desirous of having. If we cannot appeal to him in the way of getting him interested, he will go spend that money we may have gotten for an incinerator, on something else, probably the first payment on an automobile.

In the domestic market, we have not sold our product to the extent that somebody else has sold his. We must, therefore, through knowledge, make the desire for that which we have to sell in the domestic market greater than that customer's desire for something else.

Our business, in so far as the selling end is concerned, and in so far as is consistent with a regulated monopoly, is competitive.

That brings us down to selling methods and I am not going into any particular details, but I want to emphasize just one more point, and that is that in developing these methods, we have had to adapt them to the present situation which is different from the situation in the past.

Customer Habit

There is more or less of an economical principle in our business, I do not know why, perhaps it is our own fault. Generally speaking, despite rate changes, the average residence customer will spend about same amount of money each year. I do not know why we depend upon the utility business to teach economy to our children. When I was a boy, I was never allowed to leave the gas light burning; growing older, the same with the electric light; my father was in the utility business and he taught me that.

Our job is to get something new that will get additional load building. The gas range is all right, essential and all that sort of thing, but it is sold by the utility more as a matter of public relations and good public contact and such merchandising profit as there may be, than in the actual selling of the product, gas. I dare say ranges have been sold in our city resulting in an actual loss in some cases larger than the additional revenue, but it is largely a matter of public relations.

The load building members are the water heaters, the incinerators, the laundry dryer, and the house heating job.

In the matter of water heating, what are some of the methods? Water heating is fairly well established. As water heating, it does not require a great deal of introduction to the customer. Good water heating, however, is an entirely different proposition, and the methods that must be pursued are, first, that the customer must know what is good water heating and not that all water heating is that to which they may have been accustomed.

A recent survey in our Company showed that less than 10% of our customers have satisfactory water heating,

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Abstract of a paper read at Annual Convention of Pennsylvania Natural Gas Men's Association, Butler, Pa., June 20-21 1928

despite the fact that a great majority heated the water with gas. The first thing is to bring home to your customer what really good water heating is. Second, an extremely helpful thing is the merchandising of the heater itself. We must be careful in this regard, that in merchandising a water heater, we do not cut ourselves off from that multitude of sales agencies represented by the plumbers and hardware dealers in our city. So, if we merchandise water heaters, we must at the same time encourage in every way the sale of good water heating, properly installed, by all other agencies that are in existence primarily to handle this equipment.

This brings us to the third point, that merchandising must be fair and your down payments must be reasonable. We should give deferred payments. We are in competition with other things, and if the automobile industry and others use the deferred payment plan, there is no reason why we should not, but in so doing our down payments should be such that the dealer or the plumber can go to some financing agency and have them market his paper and still remain on a competitive basis with us.

House Heating

Good house heating nine times out of ten in this natural gas territory depends absolutely upon the adequacy and design of the equipment, and how it is installed in the house.

Recently, while in a little gathering, we got on to the question of heating houses, and I asked bashfully, "Do you use gas for house heating?" I asked all of the seven present in turn, and outside of myself, not one present in that group heated his house with natural gas.

The reasons are many and I need not go into them.

Some of this selling starts at home. If we are to get the rank and file of the public to heat with gas, must we not show a little bit of judgment?

I live in a duplex, where the two apartments are as alike as two peas. I have a boiler designed to burn gas, one of the three or four good ones I feel are really worthy of our attention. My neighbor did not put in this kind of a boiler. My bill in the highest month last winter was $20.00, and the house was always at a temperature of 70 degrees from 5:00 in the morning to 11:00 or 12:00 at night. Our neighbor did not have this comfort and paid $40.00.

In this question of house heating, as I see it, the method to be used is educational. We must make the customer realize the difference between this gas furnace and that one over there.

The builder does not want to know all about house heating, because his object is merely to sell the house. However, that is the method, and the method depends absolutely upon knowledge reaching the customer.

That is really all there is to the method, and in conclusion I wish to say that the Operating Department is absolutely essential to the Sales Department.

We have heard a great deal about providing for maximum demand whenever it may occur, and that is not a problem of the Sales Department. It is a problem generally of management and of the Operating Department, and the Operating Department must meet that demand whenever it comes, or all of that which I have stated is of no value, because, after all, we are not trying to sell so many cubic feet of gas. We are selling comfort. The old man is lazy and he wants the house to be consistently heated, and he wants it at a price he thinks is reasonable. This in a large measure rests in the hands of the Operating Department.

There are many selling leads that can be furnished by the Operating Department men, and the meter readers. Do your operating men know what good water heater installation is? Do they know a good one? Do they tell the Sales Department when they know where one is needed? It is all a part of the day's work, and is absolutely essential, and I make a final plea in this that we have knowledge, and that this knowledge be transmitted to our customers.

With the man in the field, turning the wells in, in ample time to meet the demand, keeping track of the probable supply from his resources during the coming winter, and the man in the pumping station, always on the alert to keep gas steadily flowing into the transmission lines, and then the distribution man, alert to discover trouble, or difficulties that may be present in their district regulators, and the man from the Accounting Department, reading the meters, finding this piece of equipment in this condition, and the other in that; when all this is done, it is only then that the Sales Department can begin to function and give service, and the salesman will continue, gentlemen, to try to serve you.

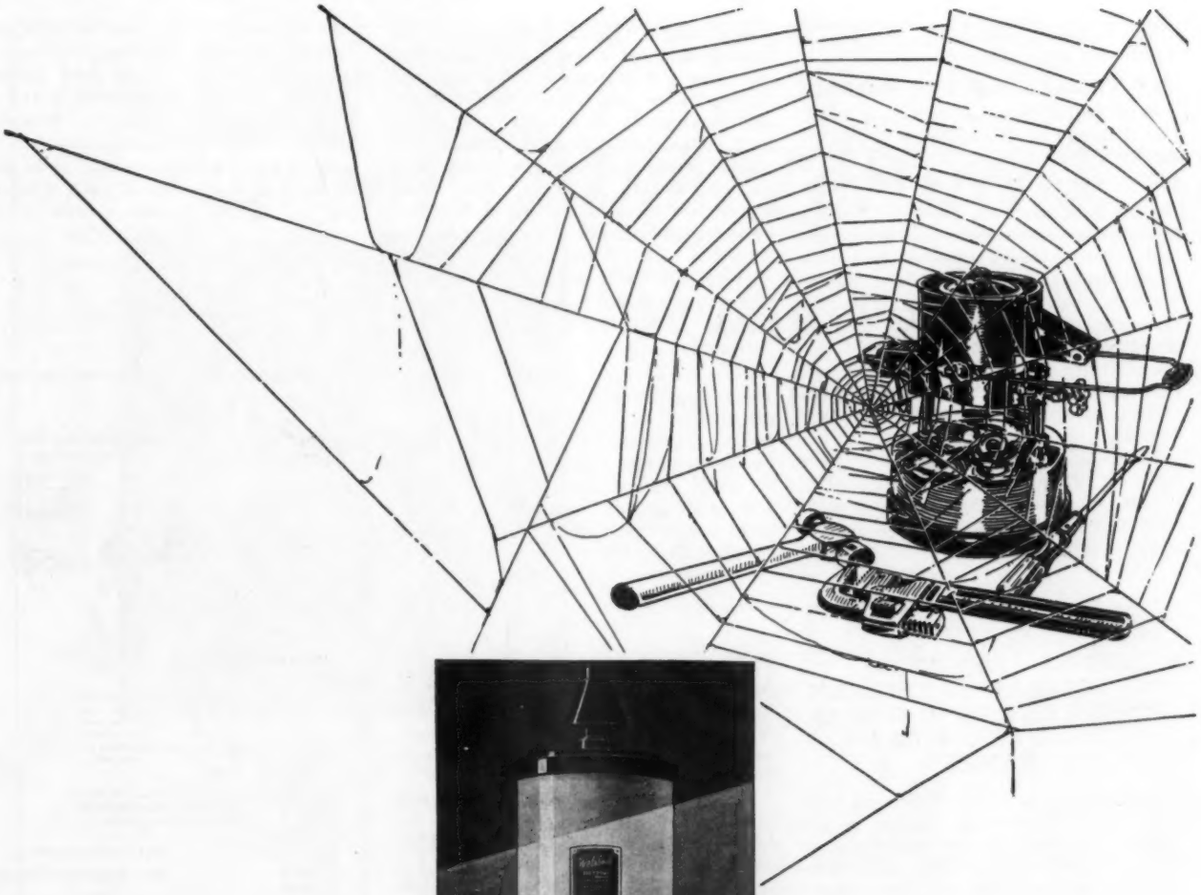
GAS RANGES BAKE POTATOES BEST

By W. B. Stoddard

THIS is the season of big picnics, parades, and out-door gatherings of all kinds. When the firemen, or the old settlers, or the American Legion stage a celebration, there is bound to be a parade, and generally there is a commercial section. Every gas man should see that he has a float entered in such a parade for it offers unexampled publicity. Instead of advertising to get people to come to his place of business to witness a demonstration of modern cooking, he has an audience ten times as large as could crowd into the salesroom, and at no expense save that of fitting up his truck in an attractive manner.

Stockton, Calif., is in the heart of the potato country, and each year they stage a big festival, with King Potato as the guest of honor. In the parade that formed one of the big features of the occasion, the Western States Gas Co. won much commendation by the attractive float they entered. It was decked in bunting of blue and white, with a

Unique Float Features California Parade.



Upkeep

The real measure of a water heater's success is found on the gas company's books under the head of "Cost of Servicing". The Welsbach Hotzone has established a record of low upkeep over a wide area of the country. Its success is two-fold — in homes and in the "net profit" columns of numerous gas companies.

The simplicity and the rugged construction of the Welsbach Hotzone Water Heater are the two main reasons for its freedom from service calls. The Hotzone burner, for instance, is of the semi-bunsen, impinging jet type and will operate with perfect satisfaction on an extremely wide range of gas qualities and pressures. There is no air shutter to be adjusted by a fitter — the proper adjustment *is in the burner* and not left to the discretion of the fitter. Moreover, there is no danger of the burner clogging up with lint and dirt and causing serious trouble.

The Hotzone thermostat is the Robertshaw type — long recognized for its reliability and efficient action. It contains no delicate adjustments — no springs, diaphragms, toggles, or magnets to get out of order. There are only three moving parts and these function perfectly and positively under direct expansion.

The Hotzone is built to endure — and it does it without the need of repairs and tinkering. The Hotzone leads the field in the campaign of "save the profits". For more information, write Welsbach Company, Gloucester City, New Jersey. Offices in Principal Cities.

Welsbach
HOTZONE
SELF ACTION GAS WATER HEATER

MEMBER AMERICAN GAS ASSOCIATION

white wound pergola, at the top of which was a big sign:

WE CHALLENGE THE WORLD

With Delta Potatoes, baked in Roper Gas Ranges, by WESTERN STATES GAS, seasoned with Stockton MPA Butter, and served by California Maids.

On the float was a white enamel kitchen table, three gas ranges, and a big gas tank. Potted plants added to the beauty of the float, and the "California Maids" in their trim white uniforms were "the cynosure of all eyes." The general attractiveness of the float won for it the second prize in the commercial section. But the effective publicity given the use of gas far over-balanced the monetary award.

In speaking of the success of their open air demonstrations, H. K. Griffin, of the Western States Gas Co., said: "We entered the float in the parade in co-operation with a local dealer handling Roper ranges. He furnished the range and the demonstrators, and we furnished the truck and gas supply. The gas was carried in the tank shown on the truck, at a pressure of 100 pounds. The truck was a working demonstration, and baked potatoes during the parade and on the streets all day. They were served hot out of the oven, with plenty of butter, and made a big hit with the crowds. Two tanks filled with gas supplied the three ranges for the entire day and no trouble at all was experienced in the open-air operation of the stoves.

"We do not sell any gas consuming conveniences ourselves, so the dealer received all of the direct sales benefit. But we figured that the publicity given gas cookery was worth many dollars to us, as it showed the efficiency of this fuel, and proved conclusively to the large gathering that 'You can do it better with Gas.'"

WINDOWS DEVOTED TO THE DISPLAY OF KITCHEN EQUIPMENT IN WHICH IS INCLUDED A GAS RANGE

Lachman Bros. in San Francisco have made many interesting displays of gas ranges, but what was perhaps the most interesting display consisted of a complete kitchen as shown in the accompanying photograph.

In the center of the kitchen there was an artistic arch and to the left of this was a gas range, set up ready for operation. In the center of the display was a table which was set ready for dining. At the left of the display and directly in front of the gas range was a kitchen table with utensils, and to the right were a kitchen cabinet, sink and refrigerator.

In the front of the display there was an attractive window card carrying the following message: "EVERYTHING TO MAKE YOUR KITCHEN A MODEL OF EFFICIENCY IS CARRIED IN OUR HOUSEHOLD DEPARTMENT — STOVES, KITCHEN CABINETS, REFRIGERATORS, TABLES, AND ALL THE OTHER ACCESSORIES."

At the upper and lower part of the window card was the firm trade-mark, consisting of a clock held by a fantastic form with the hour hands pointing at the figure 3, and below the clock the words, "GIVE TIME."

These trade-marks are also built into the base of the front of each window and are lighted by an electric globe placed back of the glass front, providing an attractive display at night.

Dinner is Ready—
The Regulated Gas Oven is Always on Time
Enjoy these pleasant afternoons in the open air and let a gas range regulator solve your cooking problems. You merely set it at the desired temperature and the oven does the rest, automatically.
Come and see how it is done. Any of the gas offices listed below will welcome your inquiries.
Telephone: TRiangle 7500
The Brooklyn Union Gas Company

Cooking by Proxy.

Featuring the Gas Range Amid Attractive Surroundings.

Longer Pipe Lengths

This photograph shows how simple it is to lay longer lengths. Pipe shown here was bronze-welded in four places

Foundry Bronze-Welded Lower Laying Costs!

SPEEDIER and more economical field construction is yours when you use longer lengths of pipe—bronze-welded at the foundry.

Your laying crew handles approximately the same number of pieces of pipe a day, regardless of length. Therefore, using longer lengths, they will lay a greater daily footage.

Your laying costs are lower, because you have fewer joints; fewer bell-holes to dig, less lead to melt, less packing, pouring and caulking.

We bronze-weld our cast iron pipe at our foundry. When it reaches you, you handle it in just the same way as if it were cast in integral pieces

We especially recommend our small-diameter pipe, in five-foot lengths welded together up to 40 feet.

OFFICES:
CHICAGO
KANSAS CITY
DALLAS
LOS ANGELES
SAN FRANCISCO
SEATTLE
MINNEAPOLIS
NEW YORK CITY

Communicate with our district offices in any of the cities named at the left.

AMERICAN CAST IRON PIPE COMPANY
BIRMINGHAM, ALABAMA
DISTRICT OFFICES IN PRINCIPAL CITIES

Association Activities

A. G. A. and affiliated gas associations' sectional activities and convention calendar

New Testing Laboratory Building to be Dedicated September 13

The new building of the American Gas Association Testing Laboratory at Cleveland, Ohio, will be dedicated and officially opened on September 13. Fitting exercises, participated in by leaders in the industry, will mark the occasion.

It is believed that many gas company and manufacturer company representatives from all parts of the United States and Canada will avail themselves of the opportunity that has been presented to review at first hand what has recently become one of the American Gas Association's major activities. In the new building they will see the finest laboratory of its kind in the world.

While the dedication ceremony will be the high spot of the activities, there will also be other features of interest to the entire industry. A meeting of the executive board has been scheduled for the morning of the 13th, and inspection tours of the building and property will be conducted all day. The dedication exercises, which will consist of the unveiling of a bronze tablet by Oscar H. Fogg, president of the American Gas Association, will be followed by a luncheon period at which prominent city and Association officials will address the invited guests. Mayor Marshall of the City of Cleveland has been invited to attend.

On Friday, September 14, the Manufacturers' Section, headed by H. L. Whitelaw, chairman, will hold the organization meetings of its new divisions. Manufacturers attending this meeting are being urged to arrive one day early in order that they may attend the opening exercises, and present indications point to the fact that many are arranging to take advantage of this opportunity.

A meeting of the Laboratory Managing Committee, in conjunction with its newly created Advisory Committee of appliance manufacturers, will probably be held the afternoon of the 13th. These activities, in addition to the dedication exercises, will make September 13 and 14 two of the most eventful days ever experienced in the Laboratory's career.

CONVENTION CALENDAR

SEPTEMBER

10-14 American Chemical Society, Division of Gas and Fuel Chemistry, Swampscott, Mass. O. O. Malleis, New York City, secretary.

17-20 A. S. M. E. National Fuels Meeting, Cleveland, Ohio.

17-21 Pacific Coast Gas Association. Annual meeting, Coronado, Cal. Clifford Johnstone, 447 Sutter Street, San Francisco, Cal., secretary.

20-21 Empire State Gas and Electric Association. Annual meeting, Saranac Lake, N. Y. C. H. B. Chapin, Grand Central Terminal, New York, N. Y., secretary.

OCTOBER

8-12 American Gas Association. Annual meeting, Atlantic City, N. J. Alexander Forward, 420 Lexington Avenue, New York, N. Y., managing director.

Plan to Attend the A.G.A. Convention

Tentative Program of Laboratory Dedication Exercises

The program of the dedication ceremonies has been announced tentatively as follows:

9.00 A. M.-5.00 P. M.—Inspection of Building and Property.

12.45 P. M.-1.00 P. M.—Dedication Exercises.

1.00 P. M.-3.00 P. M.—Luncheon and Addresses.

9.00 P. M.-11.30 P. M.—Dancing and Cards.

The time given is Eastern Standard (Cleveland).

Manufacturers' Section To Hold First Conference in New Laboratory Building

The first conference of the Manufacturers' Section of the American Gas Association will be held at the new A. G. A. Testing Laboratory Building, Cleveland, Ohio, on September 14, the day following the dedication ceremonies of the building.

Various delegates representing the manufacturers' groups, as recently organized in the section, are expected to attend, and invitations have also been extended to members of the executive board and other prominent men in the manufactured and natural gas industries.

H. Leigh Whitelaw, chairman of the manufacturers' section, will preside at the sessions. A tentative program of addresses has been announced by C. W. Berghorn, secretary.

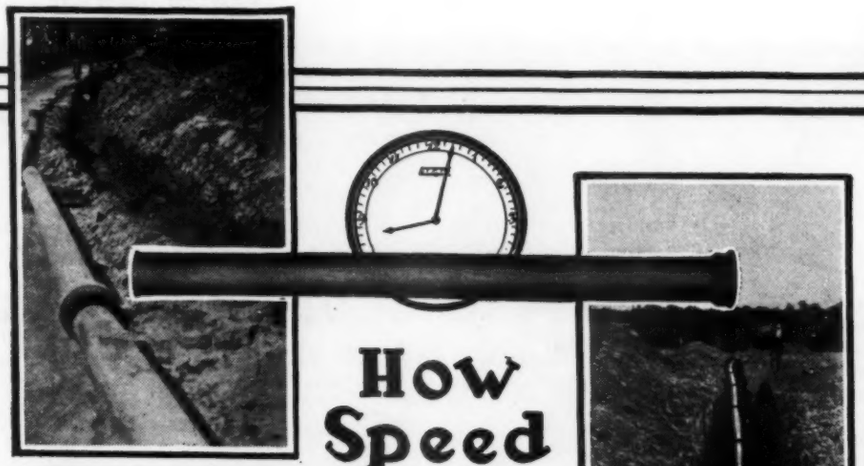
Oscar H. Fogg, president of the American Gas Association, will present an address on the value of manufacturers' organization to the gas industry. This will be followed by an address by Alexander Forward, managing director of the A. G. A., on the value of such an organization to the Association.

National advertising is the subject to be presented by Clifford E. Paige, vice-president of the Brooklyn Union Gas Company, and chairman of the Association's committee on national advertising. Alexander Macomber, Charlestown Gas and Electric Company, and Merle Abbot, Glenwood Range Company, will address the manufacturers on various aspects of the plan of regional advertising now being conducted by the New England Gas Association. F. A. Lemke, of the Humphrey Heater Company, will talk on the manufacturers and national advertising.

W. C. Beckjord, chairman, technical section, will address the meeting on cooperation in research, and H. O. Loebell, Combustion Utilities Company; W. H. Carrier, Carrier Engineering Company, and Mr. Rastall, Department of Commerce, will also present papers on this important subject.

"The Economics of Selling" will be the subject of an address by a prominent banker. Prepared discussion on this subject will be given by Col. Oscar H. Fogg, R. C. Hoffman, Jr., president Standard Gas Equipment Corporation; D. B. Stokes, U. S. Cast Iron Pipe Company, and others.

Benard J. Mullaney, vice-president of the American Gas Association, will have for his subject, "The Laboratory Seal of Approval," and H. Leigh Whitelaw will discuss the same theme.



How Speed Contributes to McWane Pipe Superiority

The element of time is a tremendously important item in making pipe as well as in laying it. The two facts that McWane Pipe is moulded simultaneously and almost instantaneously determine to a great extent the high quality of the casting.

All parts of the pipe are moulded at the same time—even the extreme opposite ends. This makes an integral casting without internal strains.

The length of time during which a pipe is moulded is practically instantaneous. There are ten to fourteen streams of molten iron flowing into a pipe at the same time—the pouring scarcely starts until it is over. Thus all parts of the casting cool at the same rate.

Moreover, it cools uniformly in sand "inside and outside" insuring strong metal, easy to tap or cut.

WRITE FOR ILLUSTRATED LITERATURE

McWANE CAST IRON PIPE CO. BIRMINGHAM, ALA.

PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH

SALES OFFICES IN PRINCIPAL CITIES

McWANE
CAST IRON PIPE

Brooklyn Polytechnic Institute to Repeat Evening Courses for Gas Men

The Polytechnic Institute of Brooklyn, N. Y., will again give a special evening course for men employed in the gas industry.

It will consist of twenty-six lectures, five works inspection trips and twenty laboratory sessions.

After a brief review of the past history of the industry, the lectures will proceed to a consideration of the general physical laws of gases and the chemical processes of combustion and gas making; these studies will be amplified by experimental work done during the laboratory sessions. Gas manufacturing processes will then be taken up in detail. Distribution systems will next be studied.

Combustion processes will then receive more detailed attention, also methods of measuring heat and temperature, both leading to a study of the principles governing efficient combustion in gas fired apparatus.

Consideration of the economics of fuel utilization in general will lead to a discussion of the economic characteristics of the various methods of producing heat. Industrial heat treatment processes, metallurgical and otherwise, and the use of gas in the home, will be given attention, also laboratory tests of the efficiency and safety of gas burning appliances.

Three concluding lectures will deal with general topics of importance in the gas industry, including accounting, future trends, and service relations with the public.

The twenty laboratory sessions are planned with a view to exemplifying the more important of the general principles involved, and are divided into four groups:

Group 1—Physical properties of gases.

Group 2—Chemistry and heat of combustion, gas analysis.

Group 3—Pressure, temperature and volume measurements of gases; compression and flow of gases.

Group 4—Furnace operation, regulation and performance.

The class will be divided into three groups working on different evenings, and each group will be divided into small squads so that every student will receive individual attention from instructors.

The course is open to only high school graduates and to those who have had the equivalent of good high school courses in physics, chemistry and mathematics. The student's rating will be dependent on attendance, problems solved, laboratory notes and reports and grades received on tests held at intervals throughout the year.

The instruction in the course will be given by members of the teaching staff of the Polytechnic Institute, assisted by specialists chosen from the gas industries, under the direction of Professor Edwin F. Church, Jr., head of the department of mechanical engineering. The hours are as follows:

Lectures—Thursdays, 6:30-7:30 P. M., beginning September 27.

Laboratory Sessions (one per week required).

Section I—Thursdays, 7.30-10.00 P.M.

Section II—Mondays, 6.30-9.00 P. M.

Section III—Tuesdays (or Wednesdays), 6.30-9.00 P. M.

First Laboratory session, Thursday, October 11.

The lecturers for the course will be: J. F. Anthes and J. Jares, of the Polytechnic Institute and the Brooklyn Union Gas Company; Professor W. F. Whitmore, of the Polytechnic Institute; A. Gordon King, of the American Gas Association; C. E. Paige, F. C. Weber, E. C. Uhlig, T. B. J. Merkt, and J. P. Payne, of the Brooklyn Union Gas Company, and A. M. Apmann, of the Consolidated Gas Company of New York.

Further information, application blanks, etc., can be secured by writing Professor Edwin F. Church, Jr., head of the department of mechanical engineering, the Polytechnic Institute, Brooklyn, New York.

Brooklyn Union Men to Receive McCarter Awards

Twenty-one men in seven different departments of the Brooklyn Union Gas Company have been awarded medals or certifificates of merit for saving human life during the past year. These awards, sponsored each year by Thomas N. McCarter, president of the Public Service Corporation of New Jersey, will be presented by officials of the American Gas Association during the convention of the Association at Atlantic City in October.

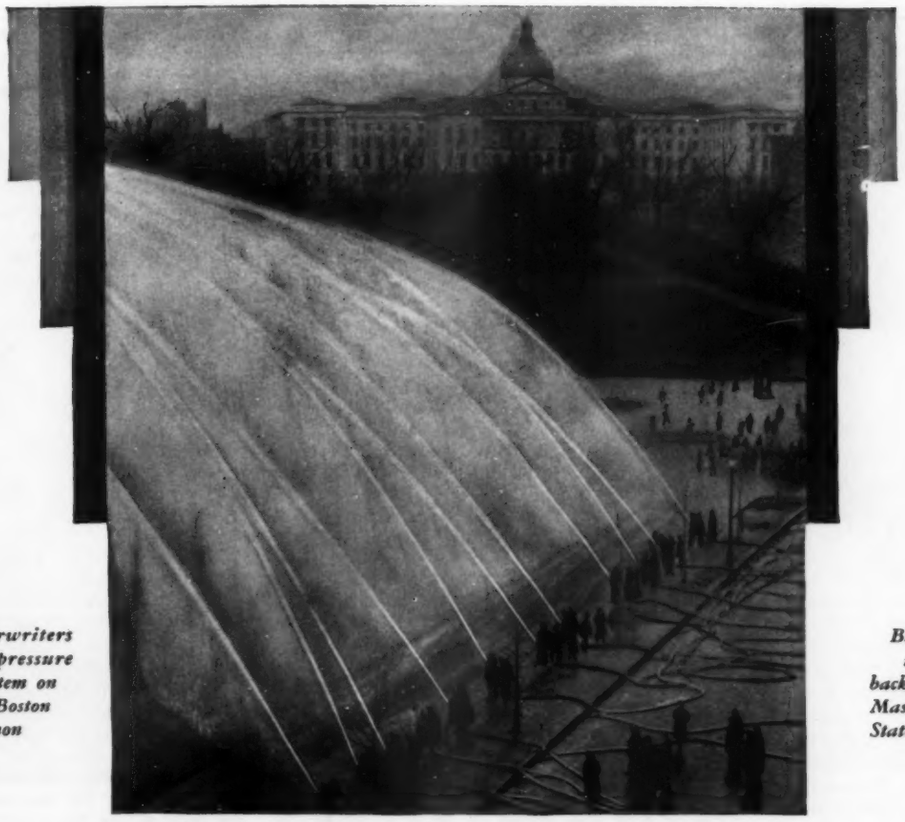
It has long been the policy of the local gas company to train all of its employees in the use of the Schaefer prone pressure method of resuscitation and, according to Clifford E. Paige, vice-president of the Brooklyn Union, the presentation of twenty-one awards in a year clearly shows the value of this work.

"We are proud of the fact," says Mr. Paige, "that thousands of our employees are trained and ready to do like service. Experience has taught us that by training the employees in this work we spread a knowledge of first aid treatment over a wide area, because the employees in turn instruct their friends and relatives. It will be recalled that last year the wife of one of our employees received a McCarter medal for saving a life by use of the Schaefer method. She had received instruction from her husband."

Vice-Presidents Paige and Staniford of the Brooklyn Union Gas Co., and some of the employees who will receive the McCarter Award.

To Study Industrial Expansion

Representatives of the New England Gas Association recently met executives of the New England Council and outlined, as first step in the gas industry's co-operation with the council, a study of the extent which Boston gas companies are actively promoting community industrial expansion and of ways by which industrial development activities on the part of gas companies can be extended. The gas association's committee was headed by David Dalt, president of the Blackstone Valley Gas and Electric Company, Pawtucket, R. I.,



Fire Underwriters test high pressure water system on historic Boston Common

Building in the background is Massachusetts State Capitol.

A WALL OF WATER

to protect historic BOSTON

COLONIAL landmarks in the heart of Boston, historic heritage of a nation, are guarded by the most modern of fire fighting equipment. Nineteen miles of auxiliary cast iron water mains are ready to supply an instant deluge of 12,000 gallons per minute under 250 lbs. of pressure.

Like the structures it protects, Boston's splendid high pressure water system was built for the ages. Cast iron mains were used throughout because, once laid, cast iron pipe can be forgotten. *There is no case on record in which it has failed under usual service conditions.* Cast Iron pipe that has been in service for over *two hundred years* is still in use today.

There are many other facts about cast iron pipe of vital interest to every taxpayer, engineer and city official. The Cast Iron Pipe Research Association will send authoritative data to any inquirer without cost or obligation. Address: Thomas F. Wolfe, engineer, Cast Iron Pipe Research Association, People's Gas Building, Chicago, Ill.

CAST IRON PIPE

and included D. D. Barnum, president of the Boston Consolidated Gas Company; Albert B. Tenney, vice president of the C. H. Tenney Company, Boston; E. E. Eysenbach, vice president and general manager of the Hartford City Gas Light Company, Hartford, Conn.; W. A. Butterick, president of the Twin State and Electric Company; Guy Dustin, president of the Gas and Electric Improvement Company of Boston; Alexander Macomber, managing director of the Portland Gas Company, Portland, Me., and C. D. Williams, secretary of the New England Gas Association.

Course in Fuel Engineering At University of Pennsylvania

A one-year course in fuel engineering will again be offered by the University of Pennsylvania starting October 1st. This course is intended primarily for those who have had the advantage of a complete undergraduate education of college grade and who have also had practical experience in fields allied to fuel engineering.

This course will lead to the degree of Master of Science in Fuel Engineering and will embrace the following:

Fuel Resources, Mining Methods: Preparation for Market; Distribution; Storage and Re-handling, Composition and Combustion of Fuels, Manufacture of Special Fuels, Uses of Fuels and Specifications for Purchase, Furnaces, Fuel Sampling, Analysis and Calorimetry, Fuel Testing in Heating and Power Appliances, Domestic Heating; Cooking; Smoke Elimination, Regulations Affecting Use of Water Power and of Fuel Resources, Research and Electives.

Additional information will be supplied upon request to The Dean, Towne Scientific School, University of Pennsylvania, Philadelphia, Pa.

Variety of Topics To Be Discussed At Second International Conference on Bituminous Coal

Twelve major topics for discussion at the Second International Conference on Bituminous Coal to be held under the auspices of the Carnegie Institute of Technology, Pittsburgh, Pa., November 19-24, 1928, are tentatively announced by Dr. Thomas S. Baker, president of the institution, and chairman of the Congress. About one hundred engineers and scientists representing fifteen nations have already tentatively accepted invitations to speak or to send papers to the Congress, and the number of speakers and delegates is growing daily. About sixty per cent of the papers will be delivered by representatives of countries other than the United States.

Although the Second International Conference will be similar in purpose to the first Congress held in 1926, preliminary plans for this year's meeting show that its scope will be considerably enlarged and the program will be more important and more international in character. The discussion of Fixed Nitrogen is one of the topics which will receive close attention. The liquefaction of coal, which was one of the principal subjects of discussion at the first meeting, will again occupy a prominent place in the deliberations. Low temperature distillation will be treated by representatives of at least a half dozen countries. High temperature distillation, power from coal, coal tars and oils, complete gasification of coal, origin of coal, coal washing, pulverized coal, catalysts, and the general aspects of the bituminous coal industry are other topics that will be considered.

To Hold Breakfast Meetings At Safety Congress

A breakfast meeting for officers, committeemen and speakers who are going to address the Public Utilities Section of the National Safety Council during the Seventh Annual Congress, which is to be held in five New York City hotels from October 1 to 5, inclusive, will take place in the Pennsylvania Hotel on Tuesday morning, October 2. The first session of the section will open at 9:30 A. M., immediately following the breakfast conference.

Gas To Be Installed in World's Largest Building

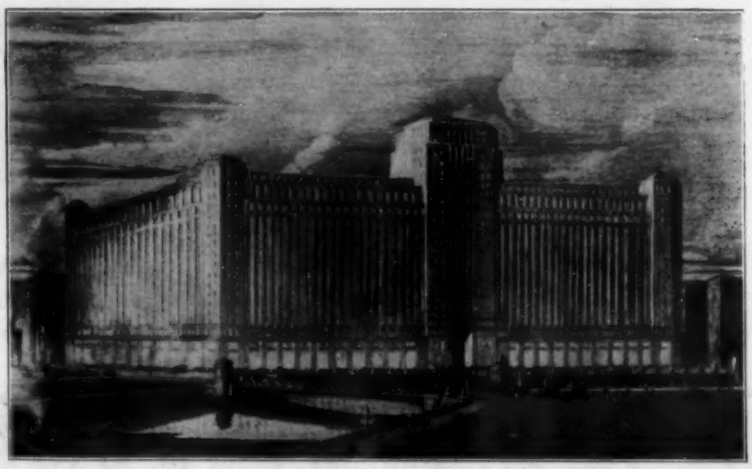
Gas will be used for various purposes in the world's largest building to be erected in Chicago in the near future.

This mammoth structure, two city blocks in length and 23 stories high, is planned for serving the convenience of merchandising buyers of the United States, and will be equipped with clubs and restaurants in which gas will be used for the preparation of food in large volumes. The building will be equipped with gas piping in anticipation of the future needs of the tenants. At any time a display is to be held on any floor sufficient gas will be found available and without any confusion, inasmuch as there are ample gas connections on each floor.

The building will cost 30 million dollars and construction will begin immediately. It is reported to be the largest single development of air rights in the world. The owner's property begins 23 feet above datum.

This new structure will be located on the site of the old Northwestern Depot at the corner of Kinzie and Wells Streets. The new building will be called the Merchandising Mart and will have a total floor space of four million square feet. Probably no other building in the world has the facilities this one will have for receiving and shipping merchandise as well as affording ideal opportunity to display and sell all sorts of merchandise. The new Mart will provide the retailer with everything but a place to sleep. He can go directly from the train to the Mart with his baggage. Here he may have his hotel reservation taken care of and his baggage placed in his room. He will have the use of the barber shop, post-office, telegraph and public stenographer. One of the biggest telephone exchanges in the world will be installed.

A great deal of attention is being focused upon various restaurants, lunchrooms and grills all within the building and all equipped with the most modern of gas burning equipment.



World's Largest Building to Be Adequately Piped for Gas.

WILL SAVE THAT EXPENSE

To men who know Pittsburgh Seamless, long, uninterrupted, trouble-free service in high pressure main and pipe lines has become only ordinary. High carbon *steel is strong steel. Forged steel** is tough steel. Seamless steel is ***flawless*** steel. Pittsburgh Seamless is all these—and tested to a 33⅓% greater safety factor!

Replacements cost heavily. Isn't it safer to use good pipe?

*High carbon steel can be used only in "Seamless".
**Pilger process.

Pacific Coast Distributors:
Buck & Stoddard, Los Angeles, California

Pittsburgh Steel Products Co.
DIVISION OF
Pittsburgh Steel Co.

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Equipment News

New Milburn "Super Master" Regulator

The Alexander Milburn Company, Baltimore, Md., announce the new Milburn "Super Master" Regulator, which has been designed to supply the demand for a regulator for use in operations where a large volume of gas or a great number of outlets are to be controlled.

The accurate reduction of varying gas pressures to the pressure required for the welding and cutting art and for industrial, scientific, medical and Government purposes, is a constant problem. This is due to the increased pressures of gases, demands for greater volumes and for greater accuracy of delivery.

Gas, such as oxygen, which is compressed in cylinders up to approximately 2,000 pounds per square inch for welding and cutting purposes has to be delivered at reduced pressures, ranging from several ounces to several pounds per square inch. For industrial purposes, it is necessary to give a large flow of gas at continuously uniform pressures in a dependable manner, day in and day out. For scientific and medical purposes it is necessary for a still more sensitive delivery of gas, as, frequently, life depends upon the result of sure control.

The bonnet of the regulator is of sturdy bolted construction. An added feature is a safety blow-off valve. The diaphragm extends to the outer circumference of the regulator and is secured by the same bolts which secure the bonnet. It is equipped with 3,000 pounds initial gauges and 500 pound delivery gauges.

The floating operating pin is of monel metal which combines high resistance to oxidation and corrosion with a tensile strength greater than mild steel. The diaphragm is of a special bronze, extremely resilient and with high corrosion resistance. An eight-inch heavy steel key affords ample leverage for the very highest pressures.

The user can reach the seat of the regulator without disconnecting it from bottle or hose. The main operating parts comprise only pin, nozzle and seat-carrying sleeve and are immediately available for examination, cleaning or removal.

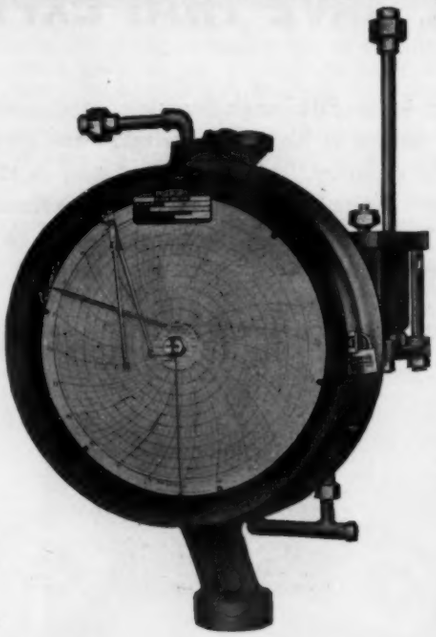
Foxboro Fluid Meter

The Foxboro Company, Foxboro, Mass., announce a new fluid meter from which they state all known errors and variables have been eliminated. The new meter has no unknown quantities and no inherent defects. To those familiar with fluid meters the advantage of extremely accurate measurement is self-evident.

All non-uniform (harmonic) motion has been eliminated. Heretofore, it was necessary either to compensate for such motion or else to admit the errors caused by it.

The meter is unique in its absence of variables. The float travel is constant, and the pen-arm length is constant at all times. The calibration is built into the meter at the factory and is permanent for life. The meter can be entirely taken apart without breaking the piping.

In addition, the Foxboro Pen-Arm Movement insures a perfect alignment



of pen arms. Every motion is positive and all rotation is about a rigidly fixed axis. There is no chance for variations.

The Foxboro Meter has a strictly uniform chart, uniformly bored mercury chambers, and uniform length pen arms, a uniform float motion transformed by constant multiplication into a uniform pen travel, resulting in absolutely uniform results. This makes it very easy to clean and set up in the field.

This meter has no stuffing boxes. It retains its long float travel, so essential for accuracy. Its check valves are positive and dependable.

A New Dixon Product

The Joseph Dixon Crucible Company, Jersey City, N. J., who have been manufacturers of graphite and graphite products for more than 100 years, have announced a new addition to their line of graphite products.

The new product is Graphite Seal—a graphite paste for sealing screw thread, flange and gasket joints of pipe lines carrying hot or cold oils, gasoline, etc. Being insoluble in oils and gasoline, this product will have many applications in oil fields and refineries, as well as extensive industrial uses on creosote, tar, vegetable and animal oil lines.

Dixon's Graphite Seal expands when subjected to heat and makes leak-proof joints that hold tight under all conditions of service. Yet these joints may be opened with ease at any time without delay or damage to tools or fittings.

It is also recommended as excellent for use on hand hole and manhole plates, etc., or wherever there is a flange and gasket connection. Numerous other uses will be suggested.

For automobiles it is recommended in place of shellac for all gaskets and also for making joints in oil and gas lines.

The Joseph Dixon Crucible Company will be glad to send further information and samples for test to those interested.

Pocket Radiation Pyrometer

The Colonial Supply Company, Pittsburgh, Pa., have issued a folder describing the K. & S. Pocket Radiation Pyrometer.

This instrument is a new development of the "total radiation" type pyrometer.

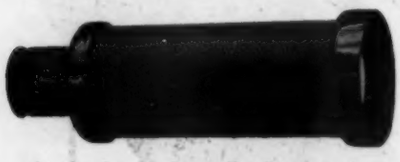
The fundamental principles on which this pyrometer operates is the measurement of the total radiant energy emitted by a hot body, whose temperature is to be determined. The theoretical relation between the temperature of a

Amarillo-Denver Gas Line

ANOTHER link in the network of great pipe lines which spread across the continent—the main line of this latest engineering conquest when completed will contain over 300 miles of 20 and 22-inch "NATIONAL" Pipe — The Recognized Standard for Gas Line Service.

NATIONAL TUBE COMPANY
Pittsburgh, Pennsylvania

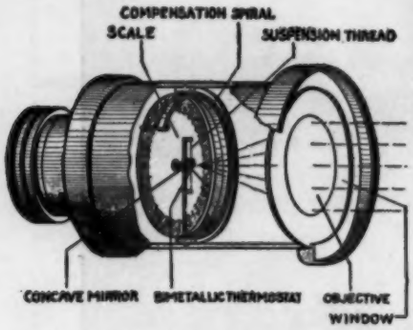
"black body" and the radiant energy emitted by it, is given by the Stefan-Boltzmann law, in accordance with which the radiant energy at any particular temperature is a direct ratio of the fourth power of the absolute temperature of a perfectly black body.



At the focus of a collecting lens having a diameter of 1½-inch and a 2-inch focal length is located a bimetallic spiral of about 0.1 inch diameter and 0.001 inch thickness. A pointer, joined to the spiral, which moves in front of a scale divided in temperature degrees, permits observing the change of the spiral. In order to obtain the highest possible sensitivity of the instrument, the spiral is fastened to a stretched wire 0.002 inches in diameter and behind the latter a small concave mirror is set.

With the practicable use of the radiation energy, the heat absorption in comparison with other types is extremely small, wherefore the spiral attains a considerable temperature even with low radiation and indicates within a few seconds the heat intensity investigated.

Due to this condition and the compensated form of the instrument, the K. & S. pyrometer is especially suitable for portable use. In order to compensate for variations of room temperatures, the scale can be turned and its momentary position relative to the pointer is automatically regulated by a compensation spiral in a very ingenious manner.



The scale is transparent and can be seen at the same time the glowing surface is viewed through the ocular, enlarged about eight times. Thereby a very high accuracy of reading is obtained, as even the slightest movement of the spiral is clearly shown. To protect the eye against the bright rays when measuring high temperature, a red glass is provided to place between the eye and the ocular.

The instrument has a "distance factor" of about 12, which means that the distance from the instrument to the furnace opening or piece of material whose temperature is to be measured should not be more than 12 times the diameter of the opening or piece.

Its application includes coke ovens, coal-gas retorts, combustion chambers of retort benches, water-gas plants, gas fired furnaces, and industrial furnaces.

A copy of folder will be mailed on request.

Safety Control for Fuel Charging Machines

A safety control for fuel charging machines used on blue gas and water gas generators has been developed by the Semet-Solvay Engineering Corporation, New York City, and has attracted much interest among plant operators.

Steere method of continuous clinkering, the coal being conveyed to the hopper by Steere Charging Machine which drops it into the generator. An electric control regulates the openings through which fuel is received and discharged.

The purpose of the control is to prevent leakage of gas during fueling. The charging machine has two outlets through which gas may escape, the magazine opening where fuel is received and the lower opening where it is emptied into the generator.

The safety control regulates the charging process in such a manner that one of these openings is always tightly closed before the other is opened. If for any reason either opening cannot be closed, the control gives a warning signal by means of a light and the charging machine stops work until the cause of the stoppage is removed.

This increase of the safety factor adds still another important advantage to automatic fueling. The charging machine increases the gas making capacity by enabling the operator to maintain a uniform bed of fuel and by saving the time previously lost in manual fueling and by making possible temperature uniformity in the generator. This latest improvement adds an important refinement that will appeal to all operators.

The safety control has been adopted as standard equipment on Steere Charging Machines. It is completely covered by patent applications.

VALVES

By Guy N. Harcourt

THE use of lubricated plug cocks in the gas industry has been increasing rapidly until now they are almost standard for use on medium high pressure distribution and transmission lines, governor pits, and at other points where absolute tightness combined with quick opening, easy turning and reliable service is required.

The ordinary type valve depends for tightness on a bearing pressure between two surfaces, of which one or both may be metal, leather, rubber, fibre or other compositions. This pressure to bring the seating surfaces together sooner or later will deform or cut the seats, depending on the force supplied to the steam and the frequency of op-

Mass Production Permits

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No. 1 SPRAGUE SERVICE REGULATORS

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Sprague Special Diaphragms
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Nickel Silver Parts
Connections: 3/4" or 1" by 3/4", 1" or 1 1/4"
Orifices: 3/16", 5/16", 3/8", or 1/2"
Special Weights for Special Jobs.
Correctly machined for absolutely interchangeable parts.

Nineteen Years of Satisfactory Service

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BRIDGEPORT, CONN.

eration. Pieces of hard scale or other foreign material some times remain on the seat, and in closing the valve these will be crushed and thus frequently prevent complete shutoff.

With the gate type valve the space in which the gate moves is likely to become filled with scale, tar, etc., which will prevent the gate from seating.

The cock type valve is not subject to these disadvantages, but has others peculiar to itself. The most important one is that of wear between the plug and body, especially when the cock is used frequently. This has led to the development of various designs in which the plug is held into its seat by means of a spring or other elastic member. This method is excellent, providing the wear is evenly distributed, but since this is seldom the case, scoring of the plug or body occurs, causing leaks which no pressure on the plug will stop. Furthermore, as pressure is applied forcing the taper plug into its seat the metallic surfaces are wedged together and the cock becomes extremely hard to turn. In case an ordinary cock is left in the open or closed position for a considerable period, the seating surfaces will frequently freeze so that the only way to free the plug is to raise it from its seat in some manner. This was accomplished by loosening the mechanism which held the plug into its seat and then, by tapping the plug on the bottom, it was raised. Some times this was effective and the plug was loosened. However, unless extreme care was taken the plug was scored or broken and the valve ruined. All of this took time and usually when it was desired to open or close the little used cock it was in an emergency and time was at a premium.

Development of Lubricated Cock

This led to the development of a lubricated type of cock, which, until recently, has been only a modification of the conventional, ages-old cock with a tapered plug and seat. To this was added a means whereby a grease could be forced to a chamber at the small end of the plug under enormous pressure which lifted the plug from its seat, breaking any cementing action between the plug and seat and making the plug easy to turn. The greatest problem which was overcome in the introduction of this type of cock was the development of the special lubricants or greases. Greases had to be developed which were insoluble in the liquids to be handled and which were not unduly affected by the temperatures encountered. Also, it soon developed that a well lubricated valve would not stick and that where reasonable attention was paid to lubrication there was seldom any difficulty. Lubrication was, however, frequently neglected, due in a large measure to the tedious method by which the lubricant had to be put into the cock. It was also discovered that the sealing of the lubricated plug cock was dependent entirely on the sealing action of the grease and not upon the metal to metal contact between the plug and its seat. Furthermore, it was found that while no pressure which a plug cock might have to withstand could force the lubricant out from between the bearing surfaces it could, however, be washed away gradually by erosion of the liquids or gases. The film of lubricant was thus destroyed, leakage resulted and the bearing surfaces were no longer protected from wear. Means for replacing lost lubricant were provided, but they depended on the voluntary effort of the operator of the valve, who frequently neglected this important task. This was, as mentioned above, due to the inconvenient method of supplying lubricant.

As has been pointed out, experience with lubricated plug cocks has developed the following:

(1) A well lubricated cock does not leak or stick.

(2) A lubricated plug cock depends on the lubricant seal for its tightness.

(3) Human nature is such that lubricant is supplied only when absolutely necessary. "The squeaking wheel gets the grease." As a corollary to this, an automatic means of lubrication from a generous reservoir is highly desirable.

The development in the lubricated type of valve has been to overcome the difficulties enumerated above; that is, to make it the least affected on the part of the operator to secure adequate lubrication at all times. The latest of this type of valve is the MacGregor Rotary Valve, in which sufficient lubricant can be induced into a reservoir in the valve by means of a pressure grease gun of the Alemite or Dot type to seal the valve and maintain a lubricated film on the bearing surfaces for many hundred operations of opening and closing the valve. The construction is such that the line pressure feeds the lubricant from the reservoir to the bearing surfaces automatically and is not affected by variations of pressure in the line whether of a few ounces or more than several hundred pounds.

Trade Catalogs

The Cleveland Gas Burner Appliance Company, Cleveland, Ohio, has recently issued some interesting broadsides on the subject of house heating by gas, which are being sent out to all gas companies.

Bulletin 40-B2 has recently been issued by the P. H. & F. M. Roots Co., Connersville, Ind. This bulletin fully illustrates and describes the new Roots Positive Displacement Meter. A copy will be sent upon request. This company has also just issued a well illustrated booklet showing the application of their products in a great number of industries.

The Oxweld Acetylene Company, New York City, have issued a small booklet on the Carbic Light, showing the application of this device for purposes of illumination on night construction work.

The B-Line Boiler Company, Cleveland, Ohio, have just issued a new 24-page bulletin describing and illustrating their line of various sized gas fired boilers. The bulletin contains a number of tables and other valuable information and ratings on water tube boilers, steam, vapor or water. A consumer's price list is included. A copy will be sent on request.

The Connersville Blower Co., Connersville, Ind., has just issued Bulletin 17A which describes their SF and SFH blowers of medium and larger capacities on lower pressure service, such as that for large heat treating furnace installations, foundry cupolas, water gas sets, etc. Copy will be mailed upon request.

Mears, Kane, Ofeldt, Inc., Philadelphia, Pa., are sending out a series of cards, 5 by 7 inches, each showing a different picture of an Ofeldt Gas Fired Boiler installation with the addition of some sales suggestions, and also listing various industries where gas fired boilers can be used to advantage.

Kernit Incinerator Company, Ampere, N. J., has recently issued a descriptive folder on the Kernit Gas Fired Incinerator. This briefly describes the Kernit and its adaptability in various places. Dimensions and other specifications are given. Copy upon request.

"Famous Methods of Famous Chefs" is the title of a 24-page booklet published by Standard Gas Equipment Corporation, New York. It contains proven recipes from some of the world's most famous chefs as well as directions for carrying out the various cooking operations on a gas range. A copy will be sent upon request.

The Anthony Company, Long Island City, New York, have issued a folder describing their Anthony Strainers for straining dirt and other foreign matter from oil, water, tar, steam, etc. Copy upon request.

THE MONEY MAKERS
are those who
"HOOK 'ER TO THE BILER"

Don't you believe it?

All right then—just name a Big Successful Concern that does not have Ridgway Elevators. Now look ahead for the limit of this space.

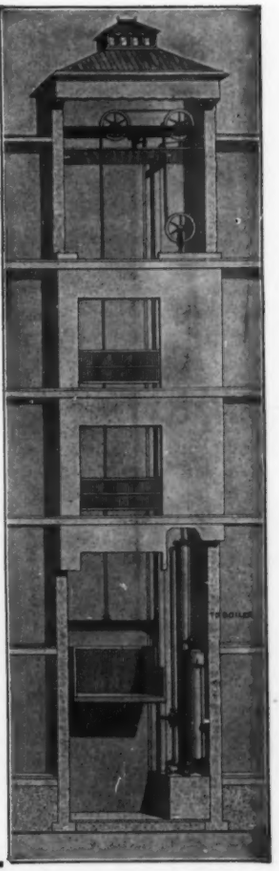
Goodrich Tire & Rubber Co., Akron, Ohio (Rubber) Has 24 Ridgway Elevators
Remington Typewriter Co., Ilion, N. Y. (Typewriters) Has 6 Ridgway Elevators
Kimberly Clarke & Co., Neenah, Wis. (Paper) Has 12 Ridgway Elevators
Wilson & Co., Chicago & Elsewhere (Meat Packers) Has 10 Ridgway Elevators
General Electric Co., Pittsfield, Mass. (Electricity) Has 9 Ridgway Elevators
Lowell Bleachery, Lowell, Mass. (Textiles) Has 6 Ridgway Elevators
United Gas Improvement Co., Philadelphia (Utilities) Has 200 Ridgway Elevators
Welsbach Co., Gloucester, N. J. (Mantles) Has 5 Ridgway Elevators
John Wanamaker, Philadelphia (Merchants) Has 4 Ridgway Elevators
Standard Underground Cable Co., Perth Amboy, N. J. (Copper) Has 6 Ridgway Elevators
American Hard Rubber Co., College Point, N. Y. (Rubber) Has 8 Ridgway Elevators
Standard Oil Co., New York (Oils, etc.) Has 30 Ridgway Elevators

There's a dozen of them! You ought to know every one. All in the millionaire class and paying fine dividends. This is the sort that

"HOOK 'ER TO THE BILER"

Direct Acting

Double Geared



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Over 3,000 *in daily use.*

SUPERIOR

Gas Meters
Provers
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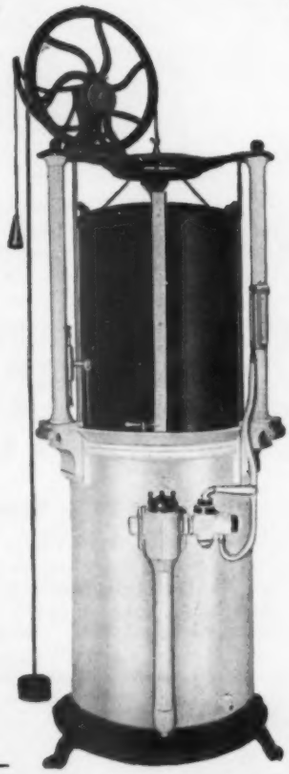

SUPERIOR METER CO.
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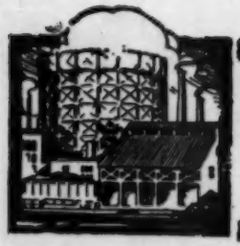
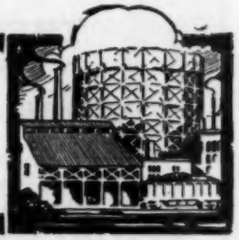


NEWS OF THE GAS INDUSTRY



Successful Lecture and Essay Course Given in Oklahoma

The Oklahoma Northern Utilities Company during the last school term tried an interesting experiment in the town of Garber, where they operate. After talking the matter over with the local school superintendent, the plant superintendent assisted in conducting a series of lectures in the science class of the high school on the subject of gas meters, their construction, and how to read them. At the conclusion of the course the pupils handed in themes which were limited to a minimum of two hundred words and a maximum of five hundred words. The best paper, submitted by Lucy Devoracek, was awarded a prize of $5, the second best paper a prize of $3, and the third prize $1.50, these prizes being given by this company. Considerable interest was manifested and the contents of the papers were much higher than expected. As a matter of interest, the winner of the second prize, Gene McLaughlin, is a young fellow who graduated this year at the age of fourteen years.

The first and second prize papers were printed in the local papers. So far as is known, this is the first time this has been tried and the results were so satisfactory that it is the intention to try it out in their other plants when school opens this fall, since the reaction has proved to be quite satisfactory.

Indiana Towns To Be Connected by Pipe Line

LaFayette and Crawfordsville will be interconnected by a gas pipe line to be built by the Northern Indiana Public Service Company, which supplies gas service in the two cities, according to a recent announcement.

Additional industrial gas business obtained in Crawfordsville necessitates laying the pipe line on which work has been started.

The company will continue to operate its plants in both cities, but as the LaFayette plant has a reserve capacity, gas manufactured in that city will be transported to Crawfordsville to supplement the output of the Crawfordsville plant, thus enabling the company to meet the demands for additional gas for industrial purposes.

The proposed line will be about 30 miles long, and gas service may be extended to small communities and farms along the route.

Laying of this pipe line is in line with the policy of the Northern Indiana Public Service Company of interconnecting many of the towns which are served with gas in the same manner as towns served with electric light and power have been interconnected with electric transmission lines, thus assuring adequate and reliable service at all times.

Laying of the LaFayette-Crawfordsville pipe line will be the fourth interconnection of this kind to be made this year. In the north end of the State pipe lines are being laid connecting Valparaiso and Michigan City, which has resulted in giving gas service to the towns of Chesterton and Porter, which heretofore did not have this service. Another pipe line is being laid between South Bend and Elkhart and a third between South Bend and Niles, Michigan.

Boston Rate Schedule Held Over

The Public Utilities Commission of Massachusetts has suspended until October 1, the new rate schedule filed by the Boston Consolidated Gas Company. The new rate provides for a service charge of fifty cents and a slight increase in the commodity charge to small consumers. Unless the Commission orders otherwise, the rate will stand us at present until October 1.

Natural Gas Service To Be Established

The Consolidated Gas Utilities Company have let a contract for the building of a natural gas pipe line from the Amarillo, Texas, field to Enid, Oklahoma, about 165 miles. Oklahoma cities en route, about ten, will get the service. It is expected that it will be operating in November. Estimated cost $4,500,000.

Unique Safety First Record Helps Cut Down Accidents

Recently a unique accident record display board was installed in the distribution department of the Los Angeles Gas and Electric Corporation and has been functioning splendidly in helping to keep down accidents.

The board consists of many glass tubes, each tube representing a man who has charge of other men, although his title may not be that of foreman. Each day a bead is dropped into each tube. The color of this bead denotes the experience of that crew for the day. If it is white, it shows that there have been no accidents; if it is blue, it signifies an accident has occurred in that man's crew. If there were two or three accidents in one crew in one day there would still be only one blue bead, as the beads represent days, not accidents.

If a gold bead appears at the bottom of the tube it signifies that that crew has experienced no accidents during the previous month.

There are three larger tubes in the upper center of the board showing the total of all accidents in the department. In these tubes the beads represent accidents and not days. A red bead signifies a lost-time accident, while a white bead signifies a no-lost-time accident. For comparative purposes the left hand tube tells the number of accidents that occurred in the previous month. The right hand tube is the current month and one bead is inserted for each accident occurring. The center tube is the same month a year ago —also for comparison.

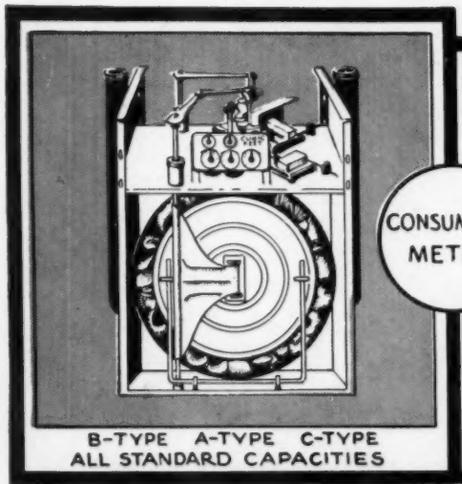
In this way the accident situation in the department is clearly and graphically visualized so everyone can see at a glance just what the situation is and has been.

Manchester to Get Gas

The Massachusetts Utilities Commission has authorized the North Shore Gas Company to distribute gas in Manchester, Mass. At present there is no gas company serving that town.

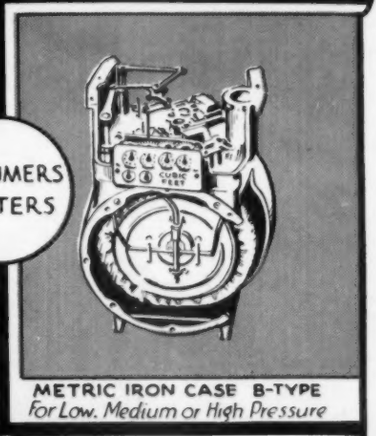
Known Factors

The Combined Skill, Experience, Resources and Facilities of Nine Factories Devoted Exclusively to the Manufacture of Gas Meters and Allied Apparatus



B-TYPE A-TYPE C-TYPE
ALL STANDARD CAPACITIES

CONSUMERS METERS



METRIC IRON CASE B-TYPE
For Low, Medium or High Pressure

AMERICAN METER CO.
MEASUREMENT ENGINEERS
CUBIC FEET

AMERICAN METER COMPANY
NEW YORK

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MARYLAND METER WORKS

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METRIC METAL WORKS

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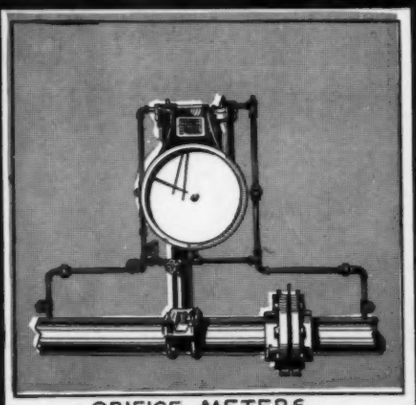
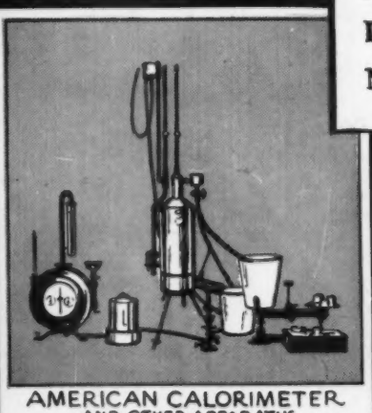
NATHANIEL TUFTS METER WORKS



ORIFICE METERS

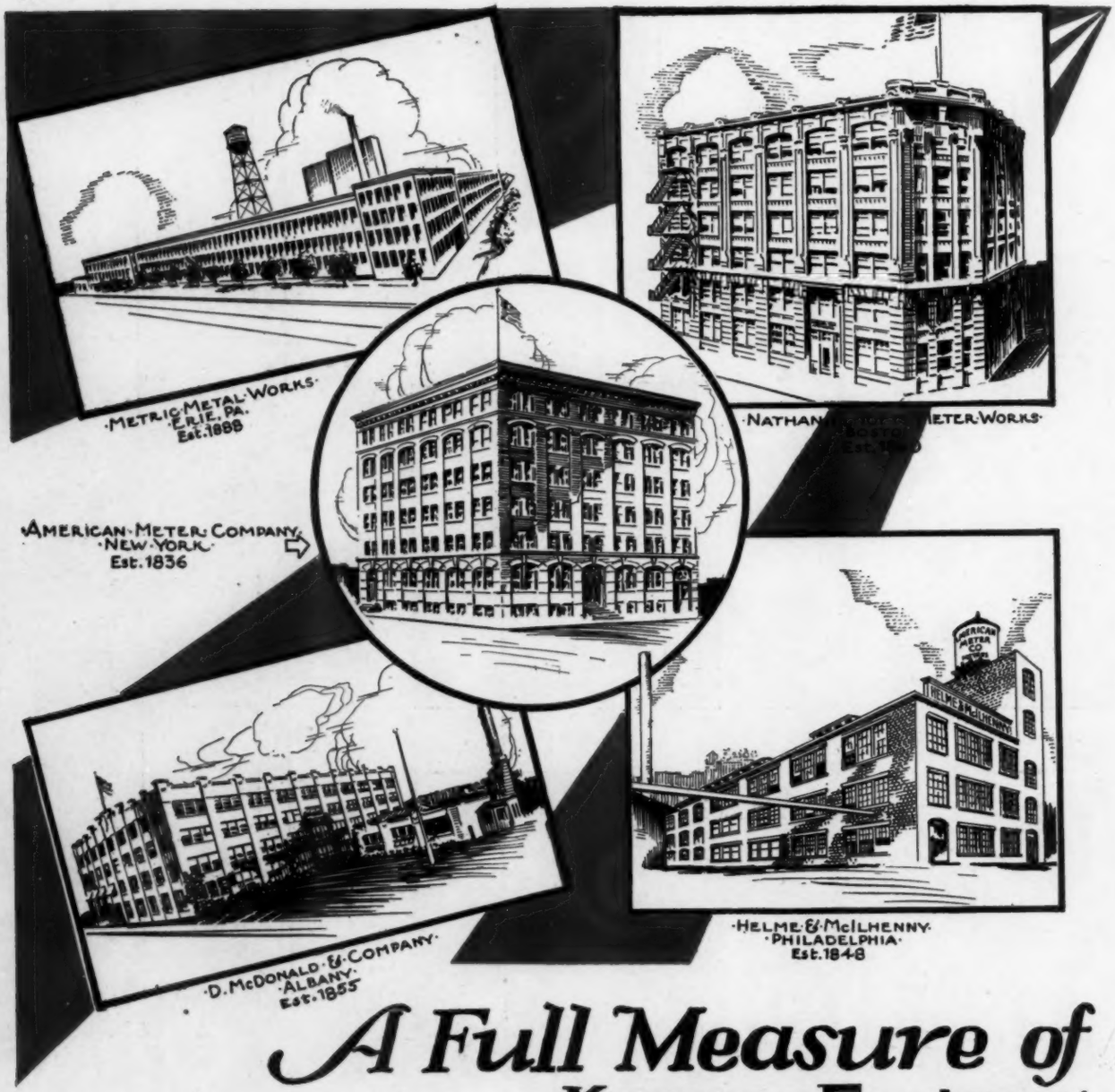


AMERICAN CALORIMETER
AND OTHER APPARATUS
RECOGNIZED AS STANDARD

The Products of American Meter Company Factories are Adapted to Requirements

A COMPLETE LINE OF QUALITY GAS METERS TO MEASURE GAS IN ANY QUANTITY EACH A KNOWN FACTOR IN METER VALUE

American Meters embody the many patented and exclusive characteristics that prolong life and accuracy over the years and that contribute to true economy in meter investment



A Full Measure of Known Factors

Every Factory of American Meter Company Possesses in Full Measure the Modern Maximum in Gas Meter Economy—Economy of Quality, in Prompt and Careful

Manufacturing Facilities

Strategic Location—Up-to-date Equipment—Departmentalized Specialization—Ample Resources and Facilities for Research and Expansion

Total Property Area	12 Acres
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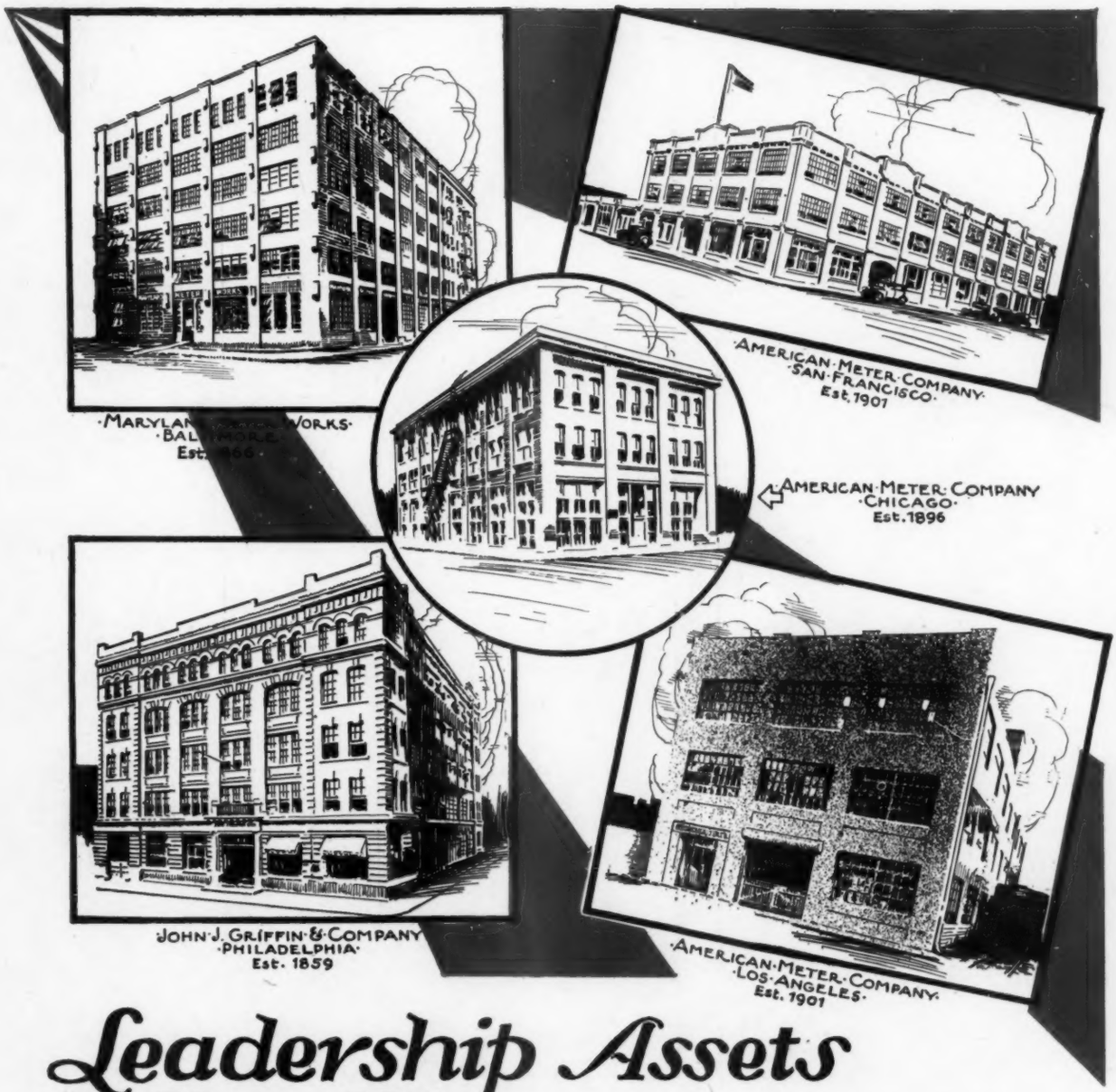
SKILLED Workmanship

From the operation of Meter Repair Shops Gas Companies appreciate the major importance of experienced personnel.
SKILLED and TRAINED workmanship is paramount in the Manufacture of Gas Meters.

Thirty-five Percent of the well taught and cohesive force that constitutes American Meter Company manpower has a record of more than 10 years of gas meter specialization with this company.

AMERICAN METER CO
MEASUREMENT ENGINEERS
CUBIC FEET



Leadership Assets in Meter Value

Manufacturing and Service Assets that are so Essential in giving Gas Companies a Delivery, of Easy Installation, Accurate Service and Low Cost of Maintenance

Experience and Progressive Policy
Through pioneer research and experimentation American Meter Company has blazed new trails in efficient and economical performance, yielding the best efforts of its engineers and research laboratories toward the advancement of industrial practice.

TODAY—The factories represented above receive from their customers that complete confidence which a long record of unfailing reliability alone can give.

AMERICAN METER COMPANY

Incorporated
Established 1836
The World's Largest Manufacturers of Gas Meters and Allied Apparatus

in Meter Value

Background, Manufacturing Record and Organization in Their Relation to the Specialized Art of Gas Meter Manufacture

GENERAL PRODUCT LIST

Consumers' Gas Meters
Tinned Steel Case and Metric Iron Case
Models—in Standard Capacities
Types—to suit specific requirements embodying characteristics and patents exclusive with American Meters

Special Meters
Demonstration Meters
Demand Meters

Extra Large Capacity
Orifice Meters
Station Meters

Apparatus
—for testing gases (American Calorimeter etc)
—for testing meters (Meter Provers etc)
—for service requirements (New American Service Pump etc)

Diaphragms
exclusive leather quality and impregnation formulas

Complete Meter Maintenance Requirements

Every Factory of American Meter Company can Supply Its Customers with Complete Gas Measurement Requirements

KNOWN FACTORS IN METER VALUE

CUBIC FEET

In the Light of—

1 *Pioneering*
2 *Experience*
3 *Faithful Performance*
4 *Deep-Rooted Identification with the Gas Industry*
5 *Widespread Approval*
6 *Territorial Specialization*
7 *Facilities for Meter Maintenance*

These are but a few of the known factors that determine the value of American Gas Meters as a profitable investment

AMERICAN METER COMPANY

Incorporated

ESTABLISHED 1836

The World's Largest Manufacturers of Gas Meters and Allied Apparatus

NEW YORK 1836 · PHILADELPHIA 1848 · ALBANY 1855 · BOSTON 1860 · BALTIMORE 1866 · ERIE 1888
CHICAGO 1896 · SAN FRANCISCO AND LOS ANGELES 1901 · KANSAS CITY

Establish New Offices in Sioux City

The Sioux City, Iowa, Gas and Electric Company and Iowa Public Service Company have established three new offices in the Sioux City division, C. E. Murphy, former sales manager for the Sioux City Gas and Electric, being made general sales engineer of the two companies; Victor O. Stafford, Waterloo, being made sales manager for the gas and electric company in charge of merchandise sales, and C. R. Tracey, New York City, being made illumination engineer, a newly created office.

Suspends Schedules of Central Hudson Gas & Electric Corporation

The Public Service Commission has suspended schedules of the Central Hudson Gas & Electric Corporation, proposing changes in its rate for gas in Poughkeepsie and suburbs, Beacon, Kingston and parts of the towns of Ulster and Catskill and part of the town of Catskill. The changes were proposed as effective August 16, and the suspension is for investigation by the Commission as to the reasonableness of the proposed changes.

Grants Petition to Change Par Value of Stock

Department of Public Utilities of Massachusetts has granted petition of Webster & Southbridge Gas & Electric Co. for authority to change its stock from $100 to $25 par value, provided there will be no change in total amount of outstanding capital stock.

New Government Publications

Prices indicated are charged by the Superintendent of Documents, Washington, D. C., for pamphlet. Send cash or money order; stamps and personal checks not accepted. When no price is indicated pamphlet is free and should be ordered from bureau responsible for issue.

The Value of Inert Gas as a Preventive of Dust Explosions in Grinding Equipment, by Hylton R. Brown. U. S. Department of Agriculture Technical Bulletin 74. 5 cents.

Alphabetical Index and Numerical List of United States Government Master Specifications, Promulgated by the Federal Specifications Board (Complete to January 1, 1928.) Bureau of Standards Circular 319.

Composition of Tar from Low-Temperature Carbonization of Utah Coal.—I., by R. L. Brown and B. F. Branting. Gives results of a joint investigation by the U. S. Bureau of Mines and the Carnegie Institute of Technology. Issued as Bulletin 35 of the Carnegie Institute and available only from that Institute, Pittsburgh, Pa. 15 cents.

Union Scales of Wages and Hours of Labor, May 15, 1927. Bureau of Labor Statistics, Bulletin 457. 35 cents.

Safety Code for Mechanical Power-Transmission Apparatus, First Revision —Rules for Guarding Prime Movers, Interm iate Equipment, and Driven Machines. Bureau of Labor Statistics B ılletin 463. 10 cents.

Effect of the Testing Method on the Determination of Corrosion Resistance, by H. S. Rawdon and E. C. Groesbeck. Bureau of Standards Technologic Paper 367. 20 cents.

Soil-Corrosion Studies—I. Soils, Materials, and Results of Early Observations, by K. H. Logan, S. P. Ewing, and C. D. Yeomans. Bureau of Standards Technologic Paper 368. 50 cents.

Atlantic City Gas Company Has Painted Direction Sign Atop Gas Holder

A progressive step in the city's air progress is the placing of a huge air guide arrow on the crown sheet of the new waterless type gas holder of the Atlantic City Gas Company.

The top of the tank bears the words, "Atlantic City—Airport One Mile" painted in letters nine feet long, and accompanied by a mammoth arrow pointing in the direction of the airport.

The arrow, painted in black against an aluminum background, is 151 feet in length and 12 feet in width, with the point and fan 27 feet wide.

The entire gas holder is painted in aluminum, a striking contrast to usual shabby black color of gas tanks.

Contemplate Supplying El Paso With Natural Gas

The Columbia Carbon Company, The Humble Oil and Refining Company, the Midwest Refining Company and the Marland Oil Company are contemplating the erection of a natural gas pipe line from Winkler County, Texas, and Lea County, New Mexico, to El Paso, 218 miles, to serve many customers. It is assured of about 20 million cubic feet of gas daily.

Acquire Additional Properties

The Iowa Railway and Light Company, and John A. Reed interests of Cedar Rapids have acquired the Carroll Iowa Gas Company, the Creston Gas and Electric Company and the Belle Plaine Gas Company. Prior to 1922, the Carroll Gas Company was owned by the Citizens' Gas Company; the Creston Company has been operating since 1925, and the Belle Plaine utility was launched in 1927. Personnel of staffs in the three towns will be unchanged. George L. Miller is president of the companies in the three towns; C. V. Englund, O. T. Conrad and John J. Miller are other officers in the interlocking directorate.

Signboard Erected by Consolidated Gas Company of New York at Bayside, Long Island

Ogden Wants Natural Gas

Ogden, Utah, has given the Ohio Oil Company a franchise to serve it with natural gas from the Baxter Basin and Hiawatha dome of Wyoming. Associated with the Ohio are the Prairie Oil and Gas Company, The Lone Star Gas Company of Texas and the Producers and Refiners Corporation. This pipe line will be more than 200 miles long and will cost about eighteen million dollars. Many towns enroute have already applied for the service and while Salt Lake City has not given its sanction, it is less than forty miles from Ogden and it is reasonable to believe that if they are waiting to see the results of Ogden's experience with natural gas, the capitol's approval only depends upon results.

Personals

Thomas P. McCrea, secretary and director of Los Angeles Gas and Electric Corporation, presented his resignation from these positions at the meeting of the board held July 25. Mr. McCrea's retirement, effective August 1, concluded a connection of more than thirty-five years with the utility organization.

Photo by Boyé
Thomas P. McCrea

At the same meeting F. E. Seaver, for some time assistant secretary of the corporation, was named to succeed Mr. McCrea as secretary, and Frank Weiss, manager of new business, was elected to the directorship made vacant by Mr. McCrea's withdrawal. E. N. Simmons, auditor, was given the additional duties and title of assistant secretary.

Mr. McCrea, who is retiring to enjoy a well-earned rest, entered the employ of the utility company in May, 1893, as accountant. Advancing later through the positions of auditor, purchasing agent and assistant secretary, he became secretary in May, 1916, and was elected a director in

F. E. Seaver

1920. He is a native of Los Angeles, and in his thirty-five years with Los Angeles Gas and Electric Corporation he has had a part in the company's development from its small beginnings to its present important position in the community.

Mr. Seaver, who succeeds Mr. McCrea as secretary, has been with the organization since May, 1907. He began as assistant bookkeeper, passing through the positions of bookkeeper, order clerk, chief bookkeeper, superintendent of Los Angeles office and assistant secretary. He has been the latter since November, 1917, and is also a director of the corporation.

Mr. Weiss, the company's new director, started in May, 1904, as a telephone clerk. He later served as bookkeeper, collection clerk, chief bookkeeper, superintendent of Los Angeles office, assistant secretary and since November, 1917, has been manager of new business.

Mr. Simmons, who now becomes auditor and assistant secretary, began in July, 1909, as a messenger, and advanced through various clerical positions to that of auditor in March, 1925.

David McKay, formerly connected with the Bangor Gas Light Company, Bangor, Maine, has been appointed by General Manager A. H. Sargent as superintendent of distribution of the company and has arrived in Bangor to take the position left vacant by the resignation of Albert W. Read, who becomes superintendent of the Bangor Water Department. Mr. McKay has been in Rutland, Vt., for a year, and returns to a position with which he is thoroughly familiar.

H. H. Lurie, of Chicago, now connected with the Claude S. Gordon consulting engineering firm there, has been appointed research associate in the Purdue Engineering Experiment Station to conduct investigations into the characteristics of torch welded joints made by the use of illuminating gas as compared with those by other methods such as electricity, acetylene, etc. This new project is to be conducted under a cooperative grant of the Utilities Research Commission of Chicago which is paying the salary and expenses for the tests. It wil be under the direction of Dr. H. L. Maxwell, of the school of chemical engineering, assisted by R. W. Lindley of the department of practical mechanics.

Lurie is a graduate of Crane Technical High School of Chicago and of the University of Illinois. He has had several years practical experience in a number of metallurgical projects, and will assume his duties at Purdue September 1.

Walter E. Vaughn has recently received a franchise for a gas plant in Merrill, Wisconsin. This town has a population of about ten thousand.

Mr. Vaughn has been in the gas business for over thirty years. During this period he has been associated with the Backus Heater Company of St. Louis, American Light and Traction Company in St. Paul and Detroit and McKinley in Quincy and Peoria, Illinois.

Walter E. Vaughn

Since 1915 Mr. Vaughn has been managaing the Oneida Gas Company in Rhinelander, Wisconsin.

L. S. Williams, president of the Harrisburg Gas Company, qualified for the Hole-in-One Club on Saturday, August 4, 1928, when he shot the seventeenth hole on the Colonial Country Club golf links in one.

The Trenching Machine with Real Mobility

This Means Efficient Digging Quickly Available For Any Size Job

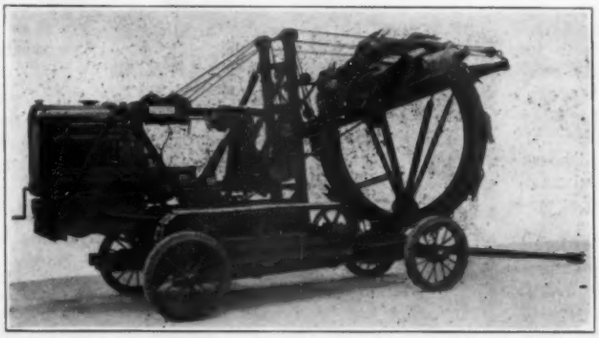
Compared to the speed, economy and efficiency of The *Cleveland* Baby Digger, hand labor is slow, costly and inefficient.

The performances of The Baby Digger have thoroughly proven its advantages and one of the chief of these many features that give it its deserved popularity is extreme mobility.

Light and compact, it can be easily and quickly moved from place to place, so easy, indeed, is it to move that it pays to do so even for relatively small jobs.

When wanted on another job The Baby Digger can be loaded on its trailer in five minutes or less and travel to the next location at truck speed where it is unloaded in the same short time.

The small center illustration shows The Baby Digger loaded ready for transportation.



The Cleveland Baby Digger loaded on specially built Trailer

This Trailer especially designed makes it possible to load and unload the Trencher simply by running it up or down on two skids carried on the trailer.

When loaded The Baby Digger violates no road laws, the extreme height including trailer is only ten feet, giving sufficient clearance for all overhead bridges, trolleys, trees, etc., and the weight is but five and a half tons.

Power, speed, sturdiness, compactness, comparative lightness of weight; ease, economy and efficiency of operation, together with extreme mobility are a few of the many features that have made The Baby Digger desirable and almost essential for efficient, economic Gas trench work.

Write today for full specifications and prices on both The Baby Digger and Trailer.

The Cleveland Trencher Company

201000 St. Clair Avenue *"Pioneers of the Small Trencher"* **Cleveland, Ohio**

THE BABY DIGGER

The year of 1928 is a success for Mr. Williams and an honor for his constituents who were playing with him: Mr. Harry S. Smeltzer, president of the Keystone Trust Company, and Mr. Warrick G. Oglesby, president of the Commonwealth Trust Company.

Mr. Williams' mashie drive carried almost 200 yards over a wide stream and tall trees. When the threesome approached the green and found Mr. Williams' ball in the hole, the golfer gave a loud whoop, and no doubt will be justly proud in describing this wonderful shot for some time to come.

Obituary

Edward W. Langdon

The death of Edward W. Langdon, branch manager at Los Angeles for The Sprague Meter Company, occurred at the White Memorial Hospital in Los Angeles August 10.

Mr. Langdon has been connected with The Sprague Meter Company for eighteen years, serving at the home office for seven years and for the past eleven years in charge of the Los Angeles branch.

Mr. Langdon was forty-eight years of age, born in Pittsfield, Massachusetts. He was a Mason, an Elk and a member of the Los Angeles Athletic Club,

He is survived by his wife, Mrs. Meta Langdon, and one son, Jack.

Death of William H. Moulton

William H. Moulton died at his home at Portland, Maine, recently at the age of 76 years. Mr. Moulton was a graduate of Bowdoin College, and was president of the Cumberland National Bank when it was voluntarily liquidated in 1912. He had been a trustee of the Portland Savings Bank and vice president and a director of the Portland Gas Light Co. He is survived by a niece, Miss Alice Ingraham, and a nephew, William M. Ingraham, who was Assistant Secretary of War under Woodrow Wilson.

Trade News and Construction

United Engineers & Constructors Inc. Activities

The Illinois Northern Utilities Company contemplates improvements to its DeKalb plant and has executed contract for a 6 ft. U. G. I. cone top carburetted water gas apparatus, together with the necessary auxiliary equipment. The installation is to be expedited so as to provide for the coming fall and winter load.

The Iowa Electric Co. has ordered a U. G. I. 4-pass high duty condenser for installation at the Muscatine plant. This condenser will be 5 ft. in diameter by 26 ft. 6 in. high, and equipped with the necessary connections to tie it into the works system.

The Philadelphia Gas Works Company has placed orders for one U. G. I. rectangular high duty condenser installed at Station "B" Works. This condenser will be 6 ft. 8 in. by 20 ft. by 32 ft. high, and will be of the 8-pass type. This unit is a duplicate of the condenser previously installed.

The Distribution Engineering Department of the United Engineers & Constructors Inc. is engaged in laying approximately seven miles of 8-inch welded steel gas main from the Orland plant of the Philadelphia Suburban Counties Gas & Electric Company to points in Montgomery County in order to tie-in existing gas mains.

Semet-Solvay Engineering Corporation has placed an order for a U. G. I. Model "B" Automatic Control to be installed at Torrington, Conn.

An order from Peoples Gas Light & Coke Company has been placed to furnish and install two 4-pass U. G. I. high duty condensers at the South Station in Chicago. Each of these condensers will be 10 ft. diameter by 25 ft. 6 in. high.

An order has been received from the New York Power & Light Corporation to furnish and install approximately 23 miles of 6-inch welded steel high pressure gas pipe to extend from Schenectady to Saratoga.

An order has been received from the Atlantic City Gas Company for the installation of a Cottrell Electrical Precipitation System having the capacity of 6,000,000 cubic feet.

In addition to the electrical precipitator, the order also includes the necessary gas piping required for the installation.

The Camden, N. J., plant of the Public Service Electric & Gas Company has placed an order for the installation of a U. G. I. mechanical generator complete with the new centrifugal dust catcher recently developed by the U. G. I.

In addition to the several contracts already awarded for plant equipment at Piscatawaytown, N. J., the Combustion Engineering Corporation has placed an order for two 9 ft. 6 in. diameter U. G. I. Tar Separators. These separators will be of steel construction with wooden baffles and will take care of tar separation in the condensate coming from the U. G. I. condensers.

Improved Equipment Company and Russell Engineering Company Combine

The Improved Equipment Company of New York and the Russell Engineering Company of St. Louis have been combined in order to meet more adequately the demand for efficient coal gas plants and modern carbonizing equipment. The new organization will be known as "Improved Equipment-Russell Engineering Corporation."

The new company will be controlled by the engineering and financial house of Henry L. Doherty & Co. The selling, designing, engineering and construction work will be handled by the combined personnel of the consolidated companies.

The manufacture of The Improved Equipment Company gas benches, equipped with the Doherty Bench Fuel Economizer, and the horizontal gas ovens of the "Improved Three Section" and "Unit" type, as well as "Russell Built" benches and ovens will be continued.

An ample supply of stock to furnish parts for repairs and renewals for the established lines of work of both companies will be maintained at advantageous shipping points.

The new organization will have the following department heads:

Floyd G. Curfman, vice-president and general manger, formerly vice-president and general manager of The Improved Equipment Company.

Irwin Rawson, vice-president in charge of sales, formerly vice-president and general manager of Russell Engineering Company.

James M. Barber, secretary and treasurer, formerly secretary and treasurer of The Improved Equipment Company.

Thomas B. Barclay, sales engineer, formerly sales engineer of The Improved Equipment Company.

Glenn H. Niles, chief engineer, formerly engineer of The Improved Equipment Company.

A. O. Schleiffarth, engineer in charge of construction, formerly engineer of Russell Engineering Company.

L. G. Crenshaw, Chicago district manager, formerly assistant general manager of Russell Engineering Company.

Charles F. Taylor, Chicago representative, formerly representative of The Improved Equipment Company.

STREET DEPARTMENT SUPPLIES

When shutting off street mains, the safest and surest way is to use the GOODMAN STOPPER.

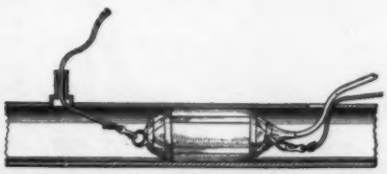
LOOK FOR THE SLEEVE LOCK

GAS MAIN BAGS

Type A—Seamless

Type B—Reinforced Seam

Type C—Canvas Covered



GOODMAN CYLINDRICAL STOPPER
(for intermediate and high pressures)

On intermediate and high pressure gas lines the Stopper is pulled into place and held with cable while being inflated.

THE OPERATION TAKES HALF A MINUTE

OTHER PRODUCTS

Air-Line Masks
Bags, Rubber and Canvas-covered
Brushes, Pipe-Cleaning
Expansion Plugs
Joint Runners
Mittens and Gloves
Safety Service Plugs
Soft Wood Plugs
Soap Tape
Binding Tape
"U"-Gauges, portable and stationary

REPRESENTATIVES

C. B. Babcock Co., San Francisco, Cal.
Circle Corp., Tulsa, Okla.
Maintenance Engineering Corp., Houston, Texas
Eastern Service Co., Boston, Mass.

COMPANY MEMBER OF AMERICAN GAS ASSOCIATION

SAFETY GAS MAIN STOPPER CO.

523 Atlantic Avenue BROOKLYN, NEW YORK

Cable Address: Gastopper, N. Y.

PIPE GANG TOOLS

Semet-Solvay Engineering Corporation Building Additional Scrubbing Apparatus for Providence Gas Co.

The Providence, R. I., Gas Company is having built additional ammonia scrubbing apparatus to meet added plant capacity. The total installation will take care of more than 10,000,000 cubic feet of gas in 24 hours. The arrangement of the scrubber shells and connections will permit the by-passing of each unit for cleaning and servicing. The present scrubbing apparatus is also Steere equipment.

The Florida Public Utilities Company has purchased a Steere multiple washer for its gas plant in West Palm Beach. The apparatus will have a capacity of 3,000,000 cubic feet in 24 hours.

The Danbury and Bethel, Conn., Gas and Electric Light Company has ordered a Doherty Washer Cooler which will be 4 ft. 3 in. in diameter and 37 ft. 10 in. high, and will have a capacity for condensing and scrubbing 1,500,000 cubic feet of gas in 24 hours. Four stacks of Steere Cooling Coils will cool the recirculated liquor. These stacks will be 20 feet long and each will contain 26 tubes sherardized to resist corrosion.

The Illinois Power and Light Corporation has ordered a 1,400-gallon R. S. De-Emulsifier for its Galesburg plant.

The Louisville, Ky., Gas & Electric Company has ordered a quantity of Steere welded steel pipe and fittings for installation at the Beargrass plant. This pipe is to be 24 in. and 30 in. in size. Flanges will be of the Van Stone type.

A Steere welded steel purifier is to be erected for the St. Louis County Gas Company at Webster Groves, Mo. It will be 32 ft. square and 12 ft. 6 in. deep, of welded steel construction and designed to conform to similar units now in service.

The Great Lakes Utilities Corporation is installing a Doherty Washer Cooler at its plant in Scottsbluff, Neb. It will be 2 ft. 6 in. in diameter and 30 ft. high. The cooling tower, pipe and fittings will be of welded steel construction.

The Vancouver, B. C., Gas Company, Ltd., has applied for license to install backruns on two eight-foot water gas machines. The gas company is erecting a new plant for the manufacture of carbureted water gas.

The Gas Corporation of Concordia, Kan., has purchased a 5 ft. Steere Water Gas Machine, equipped with backrun. A 14 ft. blast line will be built to serve the machine. There will also be erected a Doherty Washer Cooler at this plant. The Washer Cooler will be 2 ft. 6 in. in diameter and 30 ft. high and contain 25 ft. of scrubber grids. Plant piping necessary to fit the new equipment for service is included in the program.

The Watertown, S. D., Gas Company has purchased a Doherty Washer Cooler. It will be 2 ft. 6 in. in diameter and 30 ft. high, and contain 25 ft. of scrubber grids. The tower and piping will be of welded steel construction.

Gas Machinery Co. to Install Water Gas and Auxiliary Equipment at Bellefonte

The Central Pennsylvania Gas Company of Bellefonte, Pa., has awarded contract for complete new water gas and auxiliary equipment, to be installed in the new gas plant at Bellefonte.

The equipment consists generally of: Two six-foot carburetted water gas sets, complete with turbo blowers, oil feed system and generator charging equipment.

The liquor circulating system is included as well as condenser and by-pass, tar washer and by-pass, P. & A. tar extractor and by-pass, purifiers, station meter and by-pass, and gas connections to outlet of meter by-pass.

The Gas Company has secured a fine piece of ground for the plant and is putting up complete new buildings, foundations, and the storage and distribution system.

Contract has been awarded for the construction of a new bench of silica retorts and settings for the gas plant at Clearfield, Pa.

This bench will be built in a new structure adjoining the present retort house, and will serve to take care of the increasing demand for gas in Clearfield.

The North Carolina Public Service Company has placed an order for new silica retorts and settings for their plant at High Point.

Contract has been awarded by the Central Indiana Gas Company for a new nine-foot carburetted water gas apparatus, complete with automatic control, overhead operating floor and auxiliary equipment for their plant at Muncie.

The new set to be placed in the new water gas building alongside of the nine-foot Gas Machinery Company set installed a few years ago will serve to give the gas company a complete set of reserve equipment for the generation of water gas.

The Gas Company of Centralia, Illinois, have placed an order for new yard piping, valves and fittings to provide for increased capacity as well as insurance of continuous plant operations.

The piping arrangement also provides for a future relief holder and additional generating equipment.

Western Gas Construction Company Receives Contract for Generator to Be Installed in Mason City

The United Light & Power, Engineering & Construction Company of Davenport, Iowa, have placed contract for one 7 ft. 6 in. generator, complete with lining, for their plant at Mason City, Iowa.

The Central West Public Service Company, Norfolk, Neb., has contracted for a 5 ft. Western Water Gas Machine, complete with blower and blast header, 12 in. hot line to holder, condenser, P. & A. tar extractor, compressor and four storage tanks, together with all intermediate piping.

Topping Co. Moves to Cleveland, Ohio

The Chas. T. Topping Machinery Company, manufacturers of excavating machinery, announce the removal of their offices from the U B Building, Dayton, Ohio, to 4403 St. Clair Avenue, Cleveland, Ohio.

The Chas. T. Topping Machinery Company manufacture the Topping Pony Ditcher, a traction driven trench excavating machine suitable for oil and gas pipe line construction and public utilities service. The Topping Pony Ditcher is unique in that it employs a Fordson or McCormick-Deering tractor for its power plant.

The company announces the completion of arrangements providing them with enlarged manufacturing facilities and plan the production of their products in larger volume.

Jacobson Appointed Special Representative by Servel

H. W. Foulds, vice-president and general sales manager of Servel Sales, Inc., announces the appointment of P. H. Jacobson as special representative for the Northeast States. Mr. Jacobson recently resigned as district sales manager for May Oil Burner Corporation, in charge of sales in New York State, the Northeastern States and Canada, with headquarters in Schenectady. His experience in the automatic refrigeration field includes several years as district sales manager in Baltimore and Pittsburgh for Kelvinator.

Mr. Jacobson will be representative for both Electrolux and Servel automatic refrigerators with temporary headquarters in Baltimore.

"Clean Up the Country!"

By obtaining the House Heating load with a
SAFE, DEPENDABLE *and*
EASILY INSTALLED UNIT

See us at
BOOTH 202
A. G. A.
Convention

SAFETY
PILOT

CONTROLLED
AIR-GAS RATIO
and RADIANT HEAT

Trade-mark

Proven Record on
Manufactured Gas--Mixed Gas--Natural Gas

ROBERTS GAS BURNER CORP.

Jackson Building, 128 West Chippewa Street, Buffalo, N. Y.

Ivy Named Vice-President

The board of directors of the National Cast Iron Pipe Company recently announced the election of Paul A. Ivy as vice-president.

Mr. Ivy is an outstanding figure in the cast iron pipe industry today. He has spent his whole business life in this connection, beginning as a boy with the old Dimmick Company, at North Birmingham.

He assisted in the organization of the American Cast Iron Pipe Company and for twenty years was its general sales manager, vice-president and secretary. He is recognized throughout the country as an authority on pipe.

Becker Appointed Vice-President of Koppers Construction Company

Joseph Becker has been appointed vice-president and general manager of the Koppers Construction Company. He has for some time been vice-president and consulting engineer of the company. Mr. Becker is well known in by-product coking circles as the inventor of the "Becker" oven.

Mr. Becker has spent twenty-five years in the by-product coking industry, having started in the laboratories of Dr. Koppers in Essen. He came to this country with Dr. Koppers in 1910 and has been associated with every installation of Koppers ovens in the United States and Canada. Two thousand nine hundred "Becker" ovens have been built or are under construction in the United States and Canada, and in addition over 600 of these ovens are in operation or under construction in England, France, Belgium, Italy and Russia.

Foster Affiliates With Roper

Mr. Wm. J. Foster, has affiliated with the Geo. D. Roper Corporation as Sales Representative in the eastern territory.

Mr. Foster is a graduate of the University of Pittsburgh, and for three years was Manager of the Standard Statistical Organization, with offices in St. Louis and Pittsburgh. Since 1923, Mr. Foster has been Eastern Manager for the Lawson Manufacturing Company.

He will reside in Germantown, Philadelphia, so as to serve the Roper trade in this territory to the best advantage.

Dana Associates With Robins Company

Richard H. Dana, formerly vice-president and treasurer of Hodge and Dana, Inc., New York City, active in the vibrating screen field, is now connected with the Robins Conveying Belt Company and will specialize in the engineering and sale of screens.

New Linde Plants

Four new Linde plants have recently started production of oxygen and are now serving the local demand in their respective localities. On July 3 a plant at 631 South 17th Street, Harrisburg, Pennsylvania, started operating in charge of J. J. Naber. A plant at 17th and West Lawrence Streets, Allentown, Pennsylvania, in charge of W. Barber, began production on July 18. On August 1 the Shreveport, Louisiana, plant, located at Foster and Thomas Streets, in charge of F. T. Rueger, started operating. Last of all, a plant at First Avenue and B Street, South Charleston, West Virginia, was added to the chain. Ed Pohlman is superintendent at the latter plant, which started manufacturing August 10. The opening of these plants brings the total up to fifty-two Linde oxygen producing plants throughout the country.

Thorn Associates With International Combustion Engineering Corp.

Grant Thorn recently resigned as sales manager of the American Cyanamid Company to become associated with the subsidiaries of International Combustion Engineering Corporation, New York, which are identified with the coal tar products and allied chemical fields.

Government Awards Contract for New Helium Production Plant

The awarding of a general contract for the erection of the buildings and other structures for the Government's new Helium Production Plant near Amarillo, Texas, to James T. Taylor of Fort Worth, Texas, is announced by the United States Bureau of Mines, Department of Commerce, which will have supervision over the project. The time for completion of the plant called for under the contract is seventy-five days.

In addition to the general contract, awards have been made to The C. & G. Copper Company of Mt. Vernon, Ohio, for compressors; to The Chicago Bridge and Iron Company for gas holders and water tank; to D. J. and W. D. Muncy of Amarillo, for the drilling and equipping of water wells and to The Texas Cyclone Fence Company for fencing the plant site.

Helium bearing natural gas for the plant will be furnished, under a contract between the Amarillo Oil Company and the Government, from the Cliffside structure lying to the northwest of Amarillo. The pipe line to bring the gas from the wells to the helium plant is now being constructed by the Amarillo Oil Company.

Since the contract between the Amarillo Oil Company and the Government was executed, the Company has completed an excellent gas well. This new well came in with an open flow volume of 7,100,000 cu. ft. per day and a rock pressure of 725 lbs. per sq. in. The helium content of the gas is as high as that from other wells on the structure. A well, lying to the southeast of the existing wells, is now being drilled.

New Gas Holder To Be Built

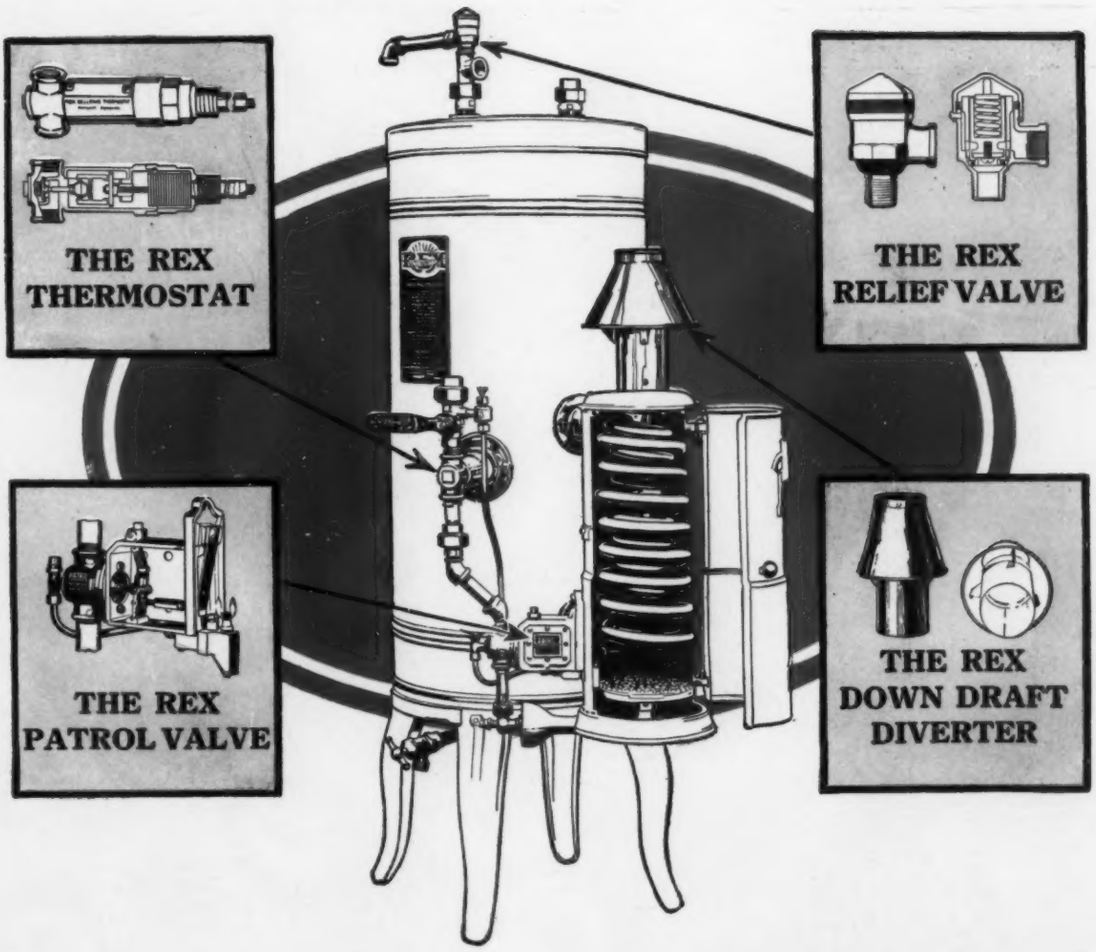
A new gas holder with a capacity of 200,000 cubic feet of gas is to be installed by the Valdosta, Ga., Gas Company, it has been announced. In addition to this, new mains, machinery and other apparatus will be installed, bringing the cost of the improvements up to $40,000. Recently the company extended its gas mains into several new sections of the city, the new gas container being made necessary by the increased territory covered. The company now has one of the best equipped gas plants in this section of the State.

Company Chartered to Drill for and Sell Natural Gas

Shore Gas Company, Inc., Buffalo, has been chartered at Albany to drill for and sell natural gas, with capital of 700 shares Class A and 300 shares Class B stock, no par value. Burt L. Herring, 65 Huntington avenue; John Brenner, 77 Thorton avenue, Buffalo; G. C. Hoffman, Clintonville, Pa., are directors and subscribers. Prendergast & Ottaway, Westfield, are attorneys for the corporation.

MacArthur Placed in Charge of Philadelphia Coke Co.

Donald MacArthur, vice-president of the Seaboard By-Product Coke Co., has, in addition to his present duties, been placed in general charge of the Philadelphia Coke Co., a subsidiary of the Koppers Gas & Coke Co. W. H. Earle, formerly in charge of the New York office of The Koppers Construction Co., will be manager of the new company; R. L. Spatz, formerly a construction engineer of the Koppers Construction Co., assistant manager, and Fred Denig, formerly assistant superintendent of the operating department of the Koppers Construction Co., superintendent. The coke plant now under construction for this company will be placed in operation by February 1, 1929.



Extras without Extra Cost

YOU do not pay extra for the integral parts which make Rex Automatic Storage Water Heaters safe and efficient. Every Rex Automatic Storage Water Heater is equipped with Patrol Valve, Rex Temperature and Pressure Relief Valve, Down Draft Diverter, in addition to the Rex Thermostat, and the heavy Hair-Felt Insulation of the Storage Tank.

The Patrol Valve

An assurance of safety. Protects, should the pilot light go out, from the dangers of escaping gas. The Patrol Valve only opens when a pilot light is burning.

The flame that lights the burner is also the flame that operates the Patrol Valve.

The Rex Relief Valve

The Rex Temperature and Pressure Relief Valve is a safe-guard against tank explosions and bursting of water piping. It protects the hot water system in emergencies such as, "too hot water" or "excessive water pressure."

Down Draft Diverter

The Rex Down Draft Diverter prevents pilot lights from being blown out by chimney down drafts. It permits better combustion of gas, by preventing interference of chimney down drafts. Made of heavy aluminum metal—non-corrosive.

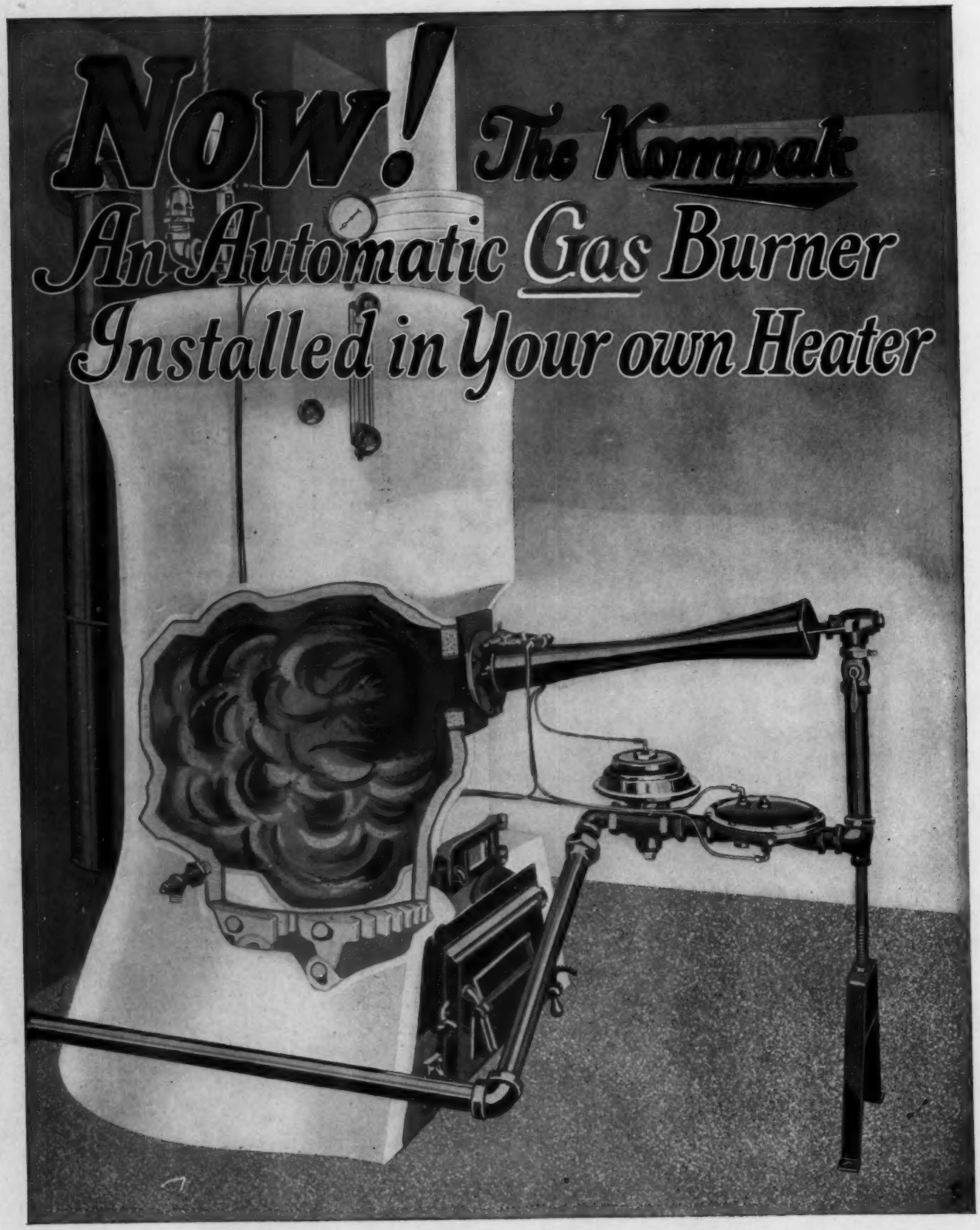
Rex Thermostat

The Rex Snap-Action Thermostat is simple in construction. The expansion and contraction of the bellows are positive in action. The self-action mechanism is fully reliable and dependable.

These are four of the "Extras" furnished with every Rex Automatic Storage Water Heater at no extra cost—that help to make satisfied users.

THE CLEVELAND HEATER CO.

1900 West 112th Street Cleveland, Ohio


NOW! The Kompak
An Automatic Gas Burner
Installed in Your own Heater

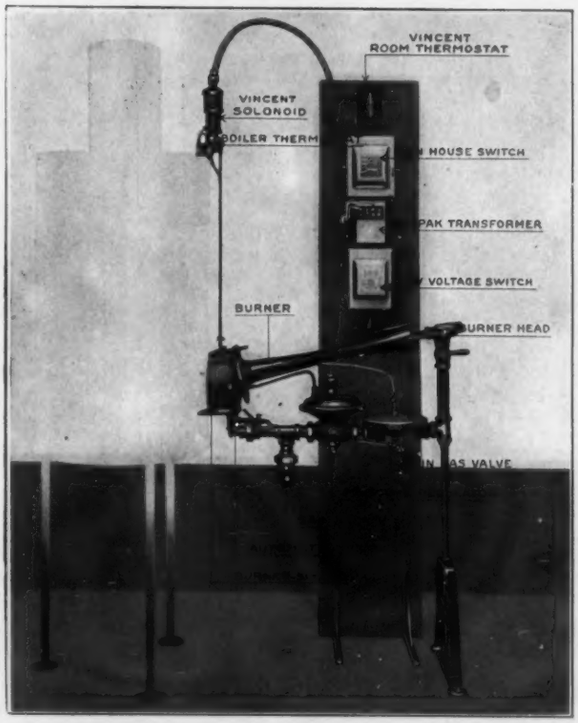
The KOMPAK AUTOMATIC GAS HEATING SYSTEM

Not just another burner — *But* a complete automatic Gas Heating System —

Efficiencies of 79 per cent to 81 per cent with yearly heating cost no higher than a regularly gas designed boiler.

Revolutionary in its simplicity of installation—maintenance and operation.

Three years of testing before being put on the market have demonstrated that at least 90 per cent of coal heaters can be utilized with a Kompak Burner to heat efficiently and economically.



Write for catalogue with our complete sales plan for the fall of 1928

THE KOMPAK CO., NEW BRUNSWICK, N. J.

COX'S COMPUTER

For High-Pressure Fluid Discharge

Will save hours of tedious, brain-tiring computation and get results instantly when seeking to find the discharge from a pipe. Also to find suitable initial and Terminal Pressures.

Based on a well-known and reliable formula, which is applicable to Gas, Air and other elastic fluids, flowing through pipes with high initial pressures.

Price $5.00 *each, net, in cloth case* 6½ *x* 8 *inches*

COX'S GAS-FLOW COMPUTER

For Low Pressure

This computer solves Prof. Pole's formula for the flow of gas in pipes. All the work is done for the Engineer in making computations relative to the subject covered by the title.

Price $5.00 *each, net, in cloth case* 6½ *x* 8 *inches*

For Sale by

AMERICAN GAS JOURNAL

53 Park Place - - - - New York City

33 *Different* Homestead Fires

A "Coalfire" or a "Woodfire" of a size and type for every fireplace.

The illustration above shows how appropriately the Homestead "Woodfire" fits in with the Spanish setting. No other fire except a Homestead "Coalfire" would be as attractive as well as utilitarian.

Models complete with andirons.

Models to be combined with andirons (*already owned by the customers.*)

Every model a Radiant Heater.

Every model a "Truly Appropriate Fireplace Heater."

If you don't handle Homestead Fires this Fall you are not going to get the Fireplace Business you should.

HOMESTEAD HEATER COMPANY, Inc.

Selvage Street and Fabyan Place WALTER KENNEDY, PRESIDENT **Newa rk, N. J., U. S. A.**

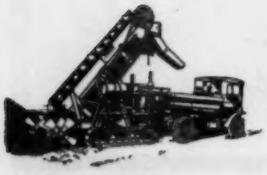
How do You revive your iron oxide?

A number of Companies have found it a great economy to use a Haiss Loader for turning over their material—both in making and reviving it.

One of the biggest of them (whose operation is pictured) has been a Haiss Loader user for a number of years—and with evident satisfaction.

A one-man operation—the Loader digs, mixes and restacks the oxide without any hand shoveling. Mechanically, the Haiss machine measures up to the highest standards of simplicity, strength and wear resistance.

Can we tell you more about this machine? Let us send Catalog 527



George Haiss Manufacturing Co., Inc.
Park Ave. & 141st Street,
New York, N. Y.

HAISS

To The Industrial Sales Manager:-

YOUR consumers rightfully expect you and your organization to be able to inform them of the developments in the fuel and furnace field that would be to their advantage to adopt.

To maintain their confidence and good will you must be completely informed.

Are you acquainted with the recent remarkable developments of this organization?

If not, you owe it to your consumers and your company to investigate.

Write, phone or telegraph.

The C. M. Kemp Mfg. Co.

Baltimore, Md.

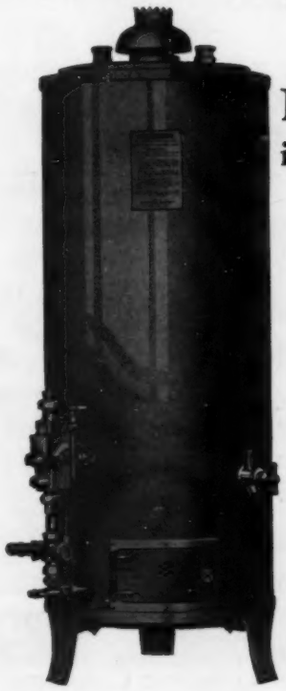
Bettered Plans for Larger Sales!

during the fall and winter, are now ready to help you to an increased volume of sales of the super value, profit making marvel of home convenience for the "whole family"—"turn a faucet" hot water service from

HUMPHREY

AUTOMATIC GAS WATER HEATERS

There are types and sizes for every purpose and purse; all of Humphrey "Built for Lasting Service" quality and value.



THE HUMPHREY KALAMAZOO STORAGE HEATER

is rich in the value characteristics of

SERVICE—always ample because quick replacement.
EFFICIENCY—low operating costs.
DURABILITY—low yearly cost to own.
SAFETY—complete and thorough.

As a leader for volume business backed by the superb material contained in these "bettered plans," will produce business in quantities during the fall and winter that will surpass SPRING AND SUMMER RECORDS.

The time to start after this splendid business is "right now."

Write for full information or for representative to go into details with you.

It Means More Business —Time is Important!

HUMPHREY COMPANY

KALAMAZOO (DIV. OF RUUD MFG. CO.) MICHIGAN

Free! a Text Book on Gas making

This valuable manual will be sent to you without charge or obligation.

It tells, in plain language, how coal and water gas are made. Explains how to save in cost of labor and materials. Tells how to locate where trouble exists. Shows plans for laying out a typical gas plant. Tells how to control all the important operations in the plant.

It is a veritable little encyclopedia on the subject of gas making. No matter whether you are the superintendent, engineer or the president of a gas works, you will find this a most interesting and instructive text book.

Write for questionnaire to be filled out for your free copy, or simply mail the coupon. The edition is limited and the regular price is $1.00. So write at once.

Consolidated Ashcroft Hancock Co., Inc.,
American Schaeffer & Budenberg Corp. Div.,
338 Berry St., Brooklyn, N. Y.

Kindly send me a questionnaire for free copy of your manual No. 7, "Manufactured Gas."

Name .....

Company .....

Address .....

Town ..... State.....

CONSOLIDATED ASHCROFT HANCOCK CO. INC.
AMERICAN SCHAEFFER & BUDENBERG DIVISION
338 Berry Street Brooklyn, N.Y.

FULTON DUPLEX
Sensitive
GAS GOVERNOR

for high pressure transmission

This governor is designed to meet the needs of artificial and natural gas companies who desire to control a high and varying inlet pressure and reduce it to a low and unvarying outlet pressure, for illuminating or fuel purposes.

The materials used in its construction are resistant to the chemical action of all manufactured gases; all frictional surfaces are eliminated, and the diaphragm surface is increased by the use of two diaphragms, thus giving it vastly greater sensitiveness and power over governors equipped with but one diaphragm.

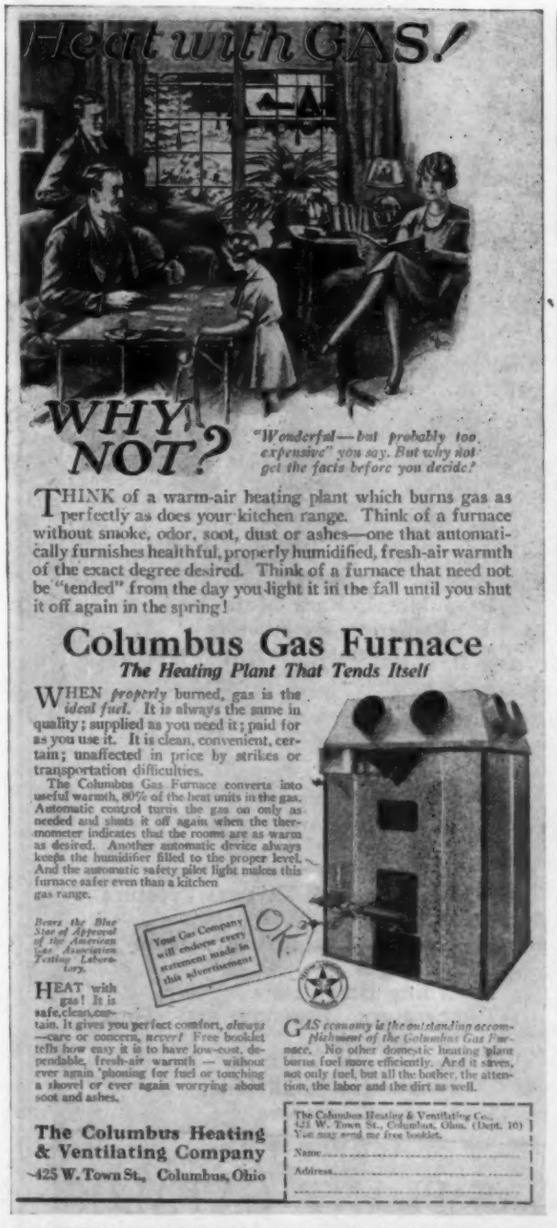
The Fulton Gas Governor is easily and quickly installed and requires a minimum of attention afterward.

Write for complete Catalogue

The Chaplin-Fulton Mfg. Co.

28-34 Penn Ave. Pittsburgh, Pa.

MILLIONS ARE READING ABOUT THE COLUMBUS GAS FURNACE


Heat with GAS!
WHY NOT?
"Wonderful—but probably too expensive" you say. But why not get the facts before you decide?
THINK of a warm-air heating plant which burns gas as perfectly as does your kitchen range. Think of a furnace without smoke, odor, soot, dust or ashes—one that automatically furnishes healthful, properly humidified, fresh-air warmth of the exact degree desired. Think of a furnace that need not be "tended" from the day you light it in the fall until you shut it off again in the spring!
Columbus Gas Furnace
The Heating Plant That Tends Itself
WHEN properly burned, gas is the ideal fuel. It is always the same in quality; supplied as you need it; paid for as you use it. It is clean, convenient, certain; unaffected in price by strikes or transportation difficulties.
The Columbus Gas Furnace converts into useful warmth, 80% of the heat units in the gas. Automatic control turns the gas on only as needed and shuts it off again when the thermometer indicates that the rooms are as warm as desired. Another automatic device always keeps the humidifier filled to the proper level. And the automatic safety pilot light makes this furnace safer even than a kitchen gas range.
Bears the Blue Star of Approval of the American Gas Association Testing Laboratory.
Your Gas Company will endorse every statement made in this advertisement
OK
HEAT with gas! It is safe, clean, certain. It gives you perfect comfort, always—care or concern, never! Free booklet tells how easy it is to have low-cost, dependable, fresh-air warmth — without ever again "phoning for fuel or touching a shovel or ever again worrying about soot and ashes.
GAS economy is the outstanding accomplishment of the Columbus Gas Furnace. No other domestic heating plant burns fuel more efficiently. And it saves, not only fuel, but all the bother, the attention, the labor and the dirt as well.
The Columbus Heating & Ventilating Co.
425 W. Town St., Columbus, Ohio
The Columbus Heating & Ventilating Co., 425 W. Town St., Columbus, Ohio. (Dept. 10) You may send me free booklet.
Name
Address

-and hundreds are sending in coupons

Cash in on this interest!

Recent issues of Better Homes & Gardens and House & Garden carried the story of the Columbus Gas Furnace.

These advertisements are educating over a million subscribers to these publications to the comfort, convenience and cleanliness of the Columbus Gas Furnace.

Reproduced is a typical advertisement that will give you an idea of the educational message that is being put across.

Many of the homes reached by these messages will be in the market for a Columbus Gas Furnace early this fall. Now is the time for you to make preparations to clinch the sale.

Ask for a copy of our new catalogue. Then get busy taking orders!

The COLUMBUS HEATING & VENTILATING CO.
COLUMBUS *Established* 1874 OHIO

Stop this Loss!

If you knew that an employee was spending hundreds of dollars a year to replace parts of your machines that were in *good* condition and did *not need* to be renewed, you would take immediate steps to stop that loss.

Yet, what difference is there between such needless waste and money spent for removal of carbon and for new parts to replace those worn out because machines were not protected from abrasive dust?

Unfiltered air contains dust, sand and grit that score cylinders, wear bearings, cause pitted and clogged valves, etc. And carbon is nothing but dust-saturated oil baked hard.

PROTECTOMOTOR AIR FILTERS

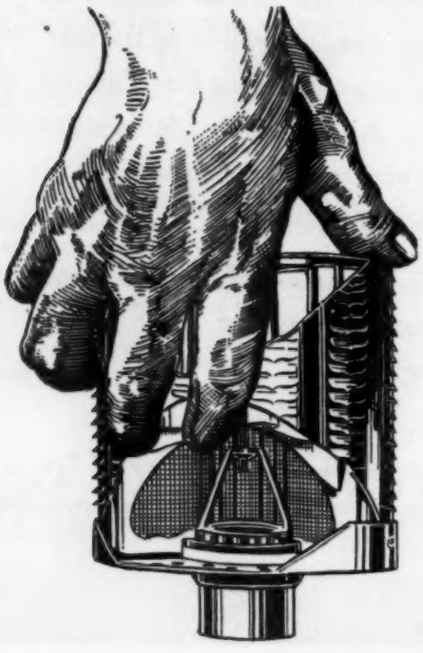
REG. U.S. PAT. OFF.
99 9/10 Per Cent EFFICIENT

eliminate these destructive elements from the air before it enters compressors, engines, blowers, compressed air tools and other air-using machines. These filters keep machines new and more efficient so they will do more work. Machines can then be operated from 3 to 5 times longer before overhauling is necessary. Think of the money that would save you!

The Protectometer Filter actually removes 99 9/10% of the dust and foreign matter from the air. It reduces carbon deposits 60 to 70%.

Over 250,000 in use. Send for our interesting booklet.

STAYNEW FILTER CORPORATION
115 North Water St. Rochester, N. Y.



Tycos Temperature Instruments

INDICATING - RECORDING - CONTROLLING

FOR YOUR GAS PLANT

Ammonia Still Thermometers
Engraved Stem Thermometers
Flue-Gas Thermometers
Gas Ranges
Gas-Main Thermometers, Straight and Angle Stem
Index Thermometers
Meter-Prover Thermometers
Precision, Engraved Thermometers
Pyrometers
Recording Thermometers
Still-Thermometers
Superheated Steam Thermometers
Temperature and Pressure Regulators
Water Circulation Thermometers
Anemometers
Aneroid Barometers
Base Metal, Rare Metal and Radiation Pyrometers
Electric Contact Thermometers
Fery Radiation Pyrometers
Hand Levels
Hydrometers
Hygrometers
Inclinometers
Mercurial Barometers
Mercurial, Recording and Index Thermometers for all Industrial and Laboratory Applications
Mercury Column Vacuum Pressure and Gauges
Mineral Oil Testing Instruments
Rain Gauges
Recording Barometers
Temperature, Pressure and Time Regulators
Thermographs
Thermometers of all kinds
Surveying Compasses

WRITE FOR
GAS PLANT CATALOG

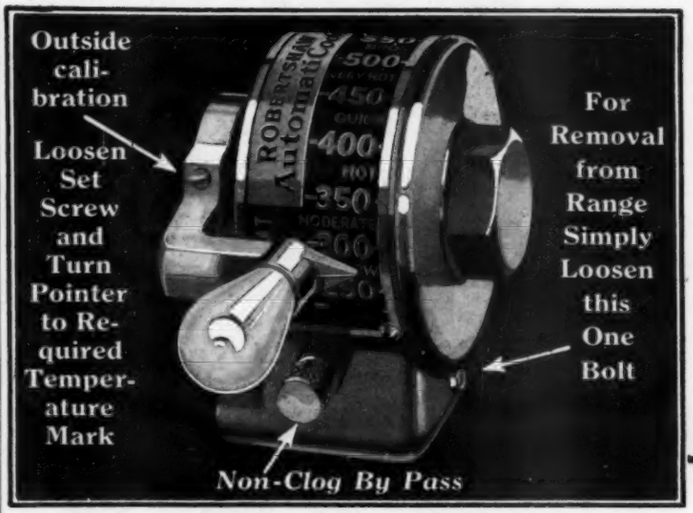
Taylor Instrument Companies
Rochester, N. Y., U. S. A.

Canadian Plant
Tycos Building
Toronto

Manufacturing Distributors
in Great Britain
Short & Mason, Ltd., London

There's a Tycos or a Taylor Temperature Instrument for Every Purpose

GAS COMPANIES and STOVE DEALERS



Appreciate the Exclusive Advantages of the "B" Type

ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

Quick Removal. Should the "B" Type AutomatiCook become damaged for any reason, necessitating replacement, it can be removed without disconnecting the range or disturbing the linings or the piping. Requires no mechanical servicing or repairs on the job. Simply loosen one bolt, replace the Thermostat with a spare and tighten the bolt. The job can be done in less than a minute's time.

Non Clog By-Pass Pilot. Will not clog nor bind. Always moves freely and maintains its adjustment. Eliminates servicing, adjusted by turning either to the right or left.

Non-Corrosive Valve Seat. The AutomatiCook is now being equipped with a Raised Non-Corrosive Valve Seat which will resist the corrosive action of gas, eliminating any possible trouble from this source.

Write for 8-Page Folder, illustrating and describing the above advantageous features.

ROBERTSHAW THERMOSTAT CO.

Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

Getting Longer Life from your superheaters . . . .

HAPHAZARD temperature control in superheater operation is extremely wasteful. Should the temperature run too high, not only is the refractory lining subject to damage, but production is also appreciably decreased by the formation of flaked lamp black and soot, which deposits in the seal and on the refractory material.

And at the other extreme, too low temperatures cause an incomplete cracking of the oils. The result—decreased yield, and waste of oil.

Bristol's Strip Chart Recording Pyrometer Model 425 provides continuous record over 45, 30 or 15 days. Faster speeds if desired.

By recording the temperatures being maintained during each moment of operation, Bristol's Pyrometers make it possible for the workmen to know at all times exactly how nearly correct temperatures are being held to the most efficient production schedule. Which means not only a better quality gas but also less danger of damage to the superheater due to undesirable temperature extremes.

Bristol's Pyrometers are simply and ruggedly constructed throughout and with reasonable care should operate satisfactorily for years.

Consult Bristol's Engineering service in regard to instrument possibilities in your plant. There's no obligation.

The Bristol Company
Waterbury, Conn.

HUNT
PIVOTED BUCKET CONVEYOR

The peculiar system of driving by pawls, of which the Hunt is the only type existent, relieves the wheel of all stress. The Hunt conveyor can assume twists impossible with a sprocket driven machine.

WE DESIGN AND BUILD:

Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope, and the "Flotograv" (Coke Reclamation System).

C.W. HUNT CO. Inc.
WEST NEW BRIGHTON, STATEN ISLAND, N. Y.
Chicago - Montreal - Boston

HUNT

DEHYDRATING EQUIPMENT FOR GAS PLANTS

Apparatus for heating boiler feed water to high temperature with the absorption of heat from partial dehydration of gas.

Andale Company

ANDALE
REG. U.S. PAT. OFF.

Sixteenth and Arch Streets
PHILADELPHIA

A NEW IMPORTANT CONTRIBUTION TO HOME BUILDING

This Forceful Advertising in Trade Building Papers is Producing a Greater Consumption of Gas.

Write for Dealer Helps

This model is a complete fireplace—a wooden mantel (either white or mahogany finish) paneling and Radiantfire of stainless steel with silver-like finish. It is of classic simplicity, adapted to any scheme or decoration or architecture. It is easy to install; no skilled labor, no tile setting, no chimney or ashpit. Takes up little wallspace.

LIVING ROOM

DINING ROOM

BEDROOM

Three Fireplaces *for* The Price of One

The salability, attractiveness and comfort of the home or apartment can be increased many times by adding these extra fireplaces.

You spend the price of three such units when you build an ordinary fireplace, with its masonry, chimney and ash pit, but there is no comparison in the efficient service that they render.

They come complete, ready for installation. All you have to do is provide a gas connection. The design of the mantel is such that it fits in with any interior.

A Humphrey "Radiantfire" provides clean, odorless heat. It is always ready for instant use. Many days in spring, fall and winter the necessity of operating the furnace can be eliminated. The joy and pleasure of sitting before a warm, attractive fire without any dirt or trouble, make satisfied owners and tenants.

Plan your Homes and Apartments for Humphrey "Radiantfire" Mantels.

Details and prices mailed on request. Write today

The
HUMPHREY
Radiantfire Mantel

No smoke—No odor. No ashes—No dust

GENERAL GAS LIGHT COMPANY, KALAMAZOO, MICH.
New York • 44 West Broadway San Francisco • 135 Bluxome Street

IF IT ISN'T A HUMPHREY, IT ISN'T A RADIANTFIRE

Kernit

REG. U.S. PAT. OFF.

GAS-FIRED INCINERATOR

KERNIT INCINERATOR CO.
AMPERE NEW JERSEY

The Fall housecleaning period is an excellent time to interest your customers in a household incinerator.

The unusually hot and humid Summer through which we have just passed has emphasized the many obnoxious and unsanitary features connected with the handling and storage of garbage and rubbish.

The Kernit is a quality product which you may offer your customers with assurance that it will give satisfactory service.

The Kernit literature for distribution to your customers is a dignified yet forceful presentation of the story of sanitation by gas incineration.

Give the public these facts and they will become incinerator conscious and accept this new usage of gas.

Kernits are made in 3 and 4 bushel sizes.

See the Kernit Display
A. G. A. EXHIBITION
—Booth No. 411—

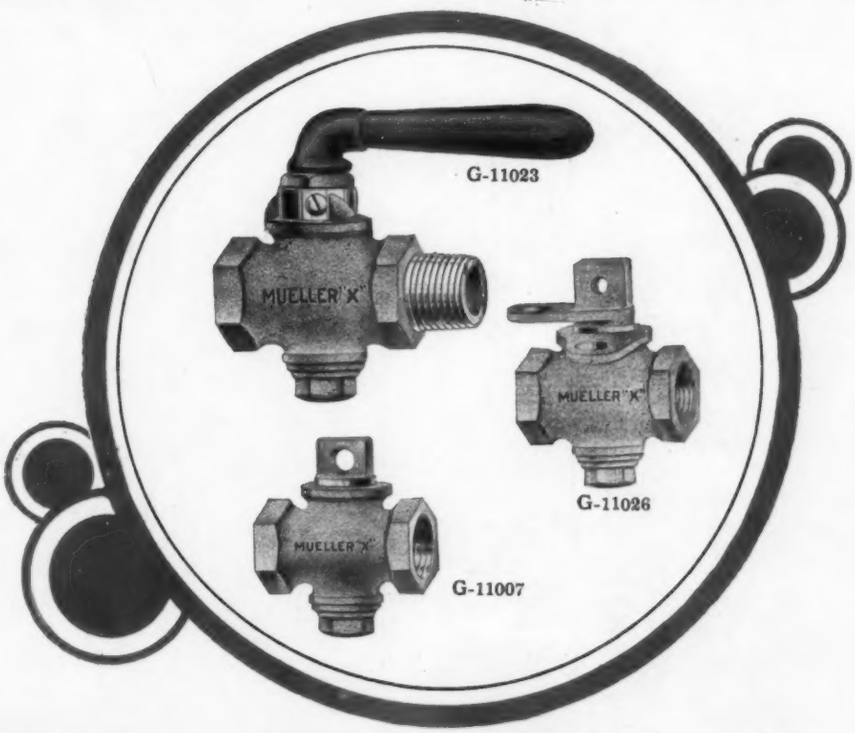
ARE YOU INTERESTED
in the protection of
STEEL PIPE LAID UNDERGROUND?

As a result of many years' experience with SEMET-SOLVAY ACID-RESISTING PAINT, during which time 227 barrels were used for similar purposes, one large Public Utility is now using this grade of Semet-Solvay Paint to protect sixty miles of eight-inch diameter STEEL PIPE, laid underground and used as a high-pressure gas main. They know by experience SEMET-SOLVAY ACID-RESISTING PAINT will prevent corrosion. The cost of protection per lineal foot is ridiculously low. It is applied cold using unskilled labor.

For further details, samples, prices, etc., write

SEMET-SOLVAY COMPANY

61 Broadway **New York City**



Buy dependability
when you buy gas stops

Dependability is the most valuable quality possible to buy in gas stops. Mueller brass stops have proved themselves through years of faithful service to the leading gas companies of America.

Uniformly high quality and construction is assured by the Mueller policy of strict laboratory control over all materials through every process of manufacture. Mueller gas stops for both high and low pressure systems are made in straight and round way patterns for all standard pipe connections. Prices and descriptions on request.

MUELLER CO. (*Established* 1857) **Decatur, Ill.**

Branches: New York, Dallas, San Francisco, Los Angeles

Canadian Factory: MUELLER, Limited, Sarnia

MUELLER

DECATUR

To the Presidents, Superintendents, Managers and Engineers *of the* Gas Companies

Your Company's copy of the American Gas Catalog was placed in the mails two weeks ago. We are confident you will be impressed with the abundant material consisting of tables, charts and other valuable informative matter contained therein, and that these will be of the greatest help to you in your everyday duties.

This information was gathered from many authoritative sources and can be fully relied upon for accuracy and reliability. We respectfully urge you to consult the Catalog, or in reality, Reference Book, frequently and also notify your employees where it can be consulted freely.

"Words cannot express how fully we appreciate this catalog."
————, Gas Superintendent

"Such a reference book as this is invaluable especially to the smaller companies."
————, Manager

"We have used this catalogue, which you have sent us each year for many years, and find it of great service to our different Gas Departments."
————, General Manager

"This is a very helpful and valuable addition to a gas engineer's library of reference books."
————, Dist. Mgr.

"We shall comply with your request by placing it at the disposal of our entire organization."
————, Sec'y & Asst. Treas.

"I can see at a glance that it is a good reference to have and will find a place on my desk where it will be handy."
————, Local Manager

"We have been making valuable use of the American Gas Catalogue each year and are pleased to note continued improvement."
————, Manager

There is also much to be learned regarding the newest, up-to-date equipment and appliances to be found in looking through the advertising sections, which you will note immediately follow the section to which such equipment or appliances pertain.

As evidence of the high esteem in which this valuable publication is held by gasmen everywhere we quote a few words of appreciation received to date, although the volume was only mailed August fifteenth.

"This is a very useful book for all of our operators and engineers."
————, Chief Engineer

"It's up to the high standard of the previous catalogs and we appreciate it very much."
————, Manager

"We find the Catalog convenient for reference not only for purchases but the tables are arranged in groups for ready reference for practical use."
————, General Manager Gas Department

"A very creditable addition to any gasman's library."
————, Manager Gas Department

"It contains some very interesting information and most certainly should be appreciated by everyone interested in the gas business."
————, Division Manager

"I appreciate the completeness of the volume which you have sent to me and will undoubtedly use it constantly as reference work. I realize the value of this publication and wish to express my appreciation for it."
————, Production Superintendent

AMERICAN GAS JOURNAL,
53 Park Place, New York.

I would like to have a copy of the American Gas Catalog for my personal use for which I agree to pay $2.50 on receipt of book.

Name..... Position.....

Address .....

City..... State.....

Published Annually by

AMERICAN GAS JOURNAL
53 PARK PLACE
NEW YORK

All Homes are Prospects for Gas Heat

Above is illustrated a No. 3-R-17 Barber Burner properly positioned in a round boiler. The same idea is carried out in a round warm air furnace. Barber Burners are furnished in sizes and capacities for any type boiler or furnace.

Thousands of Installations of

BARBER Patented JET GAS BURNERS

Will be Sold During the Next Few Months

Start right now to get your share of this very profitable business. If you have not received our Catalogue No. 28, write for it to-day. It is practically a text-book on "conversion work". Get our demonstrating outfit, shown on Page 10 of the catalogue, and set it up in your showroom. With it you can easily show the "how" and "why" of Barber CONVERSION Burners, and convincingly demonstrate their superiority over all other types of burners.

Get our Window Display Signs—they will create many inquiries that will result in sales. Get our circulars and broadsides for mailing to your prospective customers—and our newspaper mats for your local newspaper advertisements. Get all these Sales Helps and start your campaign at once.

Hundreds of your customers are waiting for you to convert their coal burning furnaces and boilers to gas. We repeat—start after this very profitable business right now.

***The* CLEVELAND GAS BURNER & APPLIANCE CO.**
Burner Specialists
3702-04 Superior Avenue, Cleveland, Ohio

ANALYTIC CHART
of
NATURAL GAS SECURITIES
Copies Sent Upon Request
Zwetsch, Heinzelmann & Co.
Inc.
57 William Street New York

Specialists in Fire Clay Refractories
With Over 30 Years Experience

Fire Brick for oil fuel furnaces, boilers and metallurgical furnaces.
Tiles and blocks of special shape for all purposes.
Muffles and planches, Coal gas benches.
Brass furnace linings, Water gas linings, Cupola linings.
Clay and Silica Retorts and settings.
Ground fire clay, Ground fire brick, Plastic fire brick, Refractory Cements.

THE JERSEY CITY REFRACTORIES CO.
135 WEST SIDE AVENUE *A. E. ACHESON* JERSEY CITY, N. J.

BAROMETERS
PHILADELPHIA, THE WORKSHOP OF THE WORLD, has 14,000 Manufacturing Establishments of which many have World-Wide Reputations.

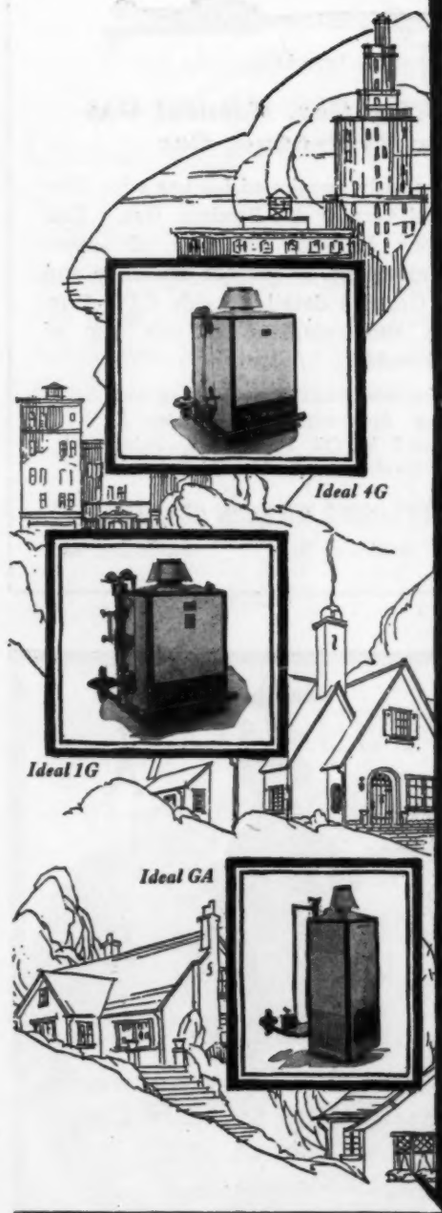
"PRINCO" STANDARD FORTIN MERCURIAL BAROMETERS

are in World-Wide use because they, too, have a "World-Wide Reputation"

THEY ARE GOOD BAROMETERS
THEY ARE REASONABLE IN PRICE!

For more than a decade they have been made in such manner that they can be shipped safely and successfully wherever there is a common carrier. This has been recognized as an achievement in Barometry.

PRECISION THERMOMETER & INSTRUMENT COMPANY
1439 BRANDYWINE STREET - - - - - - PHILADELPHIA, PA.



AN IDEAL GAS BOILER *for* EVERY *heating need!*

For cottages or bungalows—with or without basements—an Ideal Arcola Gas Heater!

For small or medium-sized homes —Ideal 1G Gas Boiler!

For larger homes and buildings— Ideal 4G Gas Boiler!

For office buildings, big apartment houses, hotels — Ideal 4G Gas Boilers in multiple units!

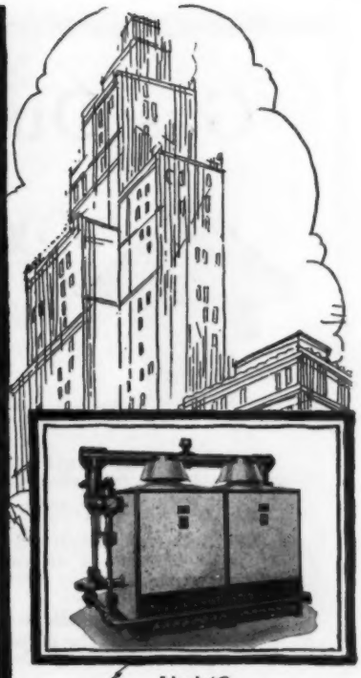
All these boilers are useful for large-volume hot-water supply and industrial applications.

THIS whole family of perfectly-designed gas boilers offers you *exactly* the right heating plant for *every* job on which you want to figure.

Designed and manufactured by the American Radiator Company, it is the latest triumph of their boiler engineers.

Ideal Gas Boilers are made available to you without delay by strategically-located distribution centers.

We have prepared for you a plan book covering every detail of selling plans that actually *work*. Won't you send for this complete and practical information?



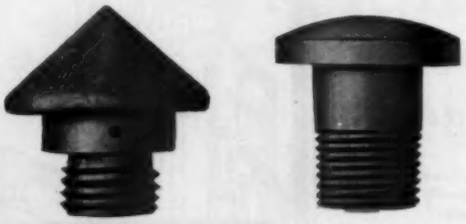
IDEAL GAS BOILERS

Product of AMERICAN RADIATOR COMPANY *Gas Utilization Dept.*

Write to AMERICAN GAS PRODUCTS CORPORATION, *Distributors*

376 Lafayette Street, New York City

Gas Outlets



There are many forms of lava that may be used as a seat for combustion with manufactured or with natural gas.

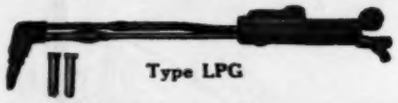
Varied in size, shape and design, lava parts are made to equip a diversified range of gas burning machinery.

Tested by manufacturers, lava has been adopted because of the properties of this material which insures its superiority as a gas outlet.

Write us for further information.

American Lava Corporation
29-59 William St. Chattanooga, Tenn.
Manufacturers of Lava Tips & Heat Resistant Insulators

Lower Cutting Costs With this Torch



Type LPG

Uses City Gas, Natural Gas or By-Product Gas

A torch especially developed for use with City Gas, Natural Gas or By-Product Gas. Employs famous Milburn principle of supermixing which results in greater efficiency and economy. Get full details of this LPG Cutting Torch and complete Milburn line of cutting and welding apparatus.

Ask for Booklet 3717 on Welding and Cutting Apparatus. Advise also if interested in Oil Pre-heaters, Paint Spray Equipment, Carbide Lights, etc.

THE ALEXANDER MILBURN COMPANY
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HYTEMPITE

is the universally used high temperature cement for Gas Plants, because it

—insures quick, economical repairs of Retorts, Jamb Joints Furnace Walls, Arches and Baffles.

—can be used with salvaged, crushed old fire brick.

—not affected by heating and cooling of ovens.

—stands up under severe weather conditions.

—makes thin, strong joint between tile or brick that stands up under extreme abrasive action of clinker tools.

—easily shot into place with Quigley Refractory Gun.

Keep a drum of HYTEMPITE in Retort House or Boiler Room for quick repairs.

Quigley Furnace Specialties Co., Inc.
26 Cortlandt St. New York, N. Y.
Stock and Service in every Industrial Center.
"HYTEMPITE" is a Quigley Product.

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW

VALVE MANUFACTURING COMPANY
TROY, N. Y.

New York 82 Gold Street | Boston Tremont Bldg. | Philadelphia Harrison Building
Chicago The Rookery | Pittsburgh Oliver Bldg. | Kansas City R. A. Long Bldg

Safety and Comfort
VS.
Danger and Drudgery

Why should any woman who oven cooks be subjected to the ever present danger of burning herself, when using her gas range?

The modern gas range is well nigh perfect with all the added accessories to contribute to the housewife's comfort and convenience. But the one vital part has been left undone. No one seems to have given a thought to the danger that lurks menacingly in the hot oven shelf.

This important, but neglected unit, has been the cause of more burned fingers, wrists and arms than any other portion of the gas range and, because women folk will not run the risk of burns to prepare the home roasts and broils, it is responsible in a great measure for the decline of the cooking load.

It's up to You!

You gas men can help to again popularize home cooking and retrieve the lost cooking load, by removing the danger and drudgery of oven cooking and making it safe and comfortable for the housewife, with the aid of

PARKE
SAFETY OVEN SHELVES

(*Patented June* 1, 1926 *and Sept.* 21, 1926)

The Parke Safety Oven Shelves remove the danger and discomfort of oven cooking. The patented handle, always cool, permits the shelf to be drawn out of the oven just far enough to give attention to the roast and broil and prevents the spilling of grease on the range or floor and on garments.

There's a big field for the sale of Parke Safety Oven Shelves as a separate unit and also for ranges equipped with them, as they represent the very last word in Safety, Comfort and Convenience to the housewife.

The Parke Safety Oven Shelves have been tested and approved by the Good Housekeeping Institute and the New York Herald-Tribune Institute, besides some of the largest Gas Companies in the East.

Write at *once* for further details.

WILLIAM PARKE, Inc.

537-549 So. Second St., Camden, N. J. - - - New York Office, 29 Perry St.

ISBELL-PORTER COMPANY

Engineers and Contractors for Complete Gas Works

I-P C

Manufacturers of All Kinds of Gas Apparatus

NEWARK - NEW JERSEY

Lix Material

guaranteed to always run uniform. It has been used by Gasworks all over the world for nearly 50 years. We offer same from a shipping point most conveniently located to your works. Shipped in bulk or bags.

Lix-Sponge

THE PERFECT READY MIXED OXIDE

For Gasworks having no facilities to mix their own Sponge we offer our celebrated "Lux-Sponge," guaranteed efficient for Coal or Water Gas.
Samples upon request.

THE ALPHA-LUX COMPANY, Inc.

192 FRONT STREET - NEW YORK CITY, N. Y.

Byllesby Engineering and Management Corporation

BYLLESBY
PIONEERS IN PUBLIC SERVICE
ENGINEERING FINANCE MANAGEMENT

CHICAGO NEW YORK

Pittsburgh San Francisco

RITER-CONLEY CO.

STEEL CONSTRUCTION

PITTSBURGH

STEEL PLATEWORK

FOR

THE GAS INDUSTRY

Gas Holders
Pressure Tanks
Steel Pipe
Steel Barges
Oil Tanks
Purifiers

BRANCH OFFICES

New York — Boston — Baltimore
Chicago — Philadelphia — Detroit
Cleveland — Cincinnati — Seattle
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SERVICE TO THE INDUSTRY

REORGANIZATIONS and MERGERS
of the Public Utilities resulting in economies of operation have benefited the entire gas industry.

MANUFACTURERS OF GAS APPLIANCES now realize the necessity of a similar development in their industry if they are to be of real service to the Utilities in the matter of future sales and dealer cooperation.

INVESTIGATION OF THE INDUSTRY
has shown decided opportunities for economies in manufacturing and marketing. Many manufacturers can improve their situation by *Reorganization, Merger or Refinancing.*

PERMANENT CAPITAL
is available through my association with reliable banking institutions in Chicago—New York—Philadelphia.

THIS SERVICE IS CONFIDENTIAL
May we have the pleasure of serving you?

CHARLES W. WARDELL
2401 CHESTNUT STREET, PHILADELPHIA, PA.

Buyers' Reference Index

See page 125 for advertisements of these products

ACCUMULATORS—STEAM
Ruth's Steam Accumulator Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The Gas Machinery Co.
United Engineers & Constructors

ACETYLENE EQUIPMENT
Milburn Co., The Alexander

ACCOUNTING MACHINES

ADDING MACHINES
Remington Rand Business Service, Inc.

AIR-LINE MASK
The Safety Gas Main Stopper Co.

AMMONIA CONCENTRATORS
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Manufacturing Co.
John S. Unger.
Western Gas Construction Co.

AMMONIA CONCENTRATED LIQUOR PLANTS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AMMONIA PIPE
National Tube Co.

AMMONIA RECOVERY APPARATUS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AMMONIA STILLS
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
John S. Unger.
Western Gas Construction Co.

APPRAISALS & INVENTORIES
United Engineers & Constructors

ASBESTOS PACKING
Safety Gas Main Stopper Co.

ASH STORAGE BINS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AUTOMATIC RAILWAYS
C. W. Hunt Co., Inc.

BAGS
Connelly Iron Sponge & Gov. Co.
Rubber & Canvas Covered
Safety Gas Main Stopper Co.

BAROMETERS
Taylor Instrument Companies
Precision Ther. & Inst. Co.

BENCHES
The Gas Machinery Co.
The Improved Equipment Co.
Isbell-Porter Co.
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors

BENCHES
Complete
Semet Solvay Engineering Co.

BENZOL
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Koppers Construction Co.
Semet Solvay Engineering Corp.
Western Gas Construction Co.

BILLING MACHINES

BOOKKEEPING MACHINES
Remington Rand Business Service, Inc.

BLOWERS
The Connersville Blower Co.
P. H. & F. M. Roots Co.

BLOWERS & BOOSTERS
Gas Engineering Co.
The Gas Machinery Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
Western Gas Construction Co.

BLUE GAS PLANT
Bartlett-Hayward Co.
Carl Still, Incorporated.
Gas Engineering Co.
The Gas Machinery Co.
The Improved Equipment Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.

BOILERS—WASTE HEAT
Bartlett-Hayward Co.
Combustion Engineering Corp.
The Gas Machinery Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
Western Gas Construction Co.

BOXES, CURB
Mueller Co.

BRICK
Silica
E. J. Lavino & Co.

BRICK, FIRE AND CHECKER
Botfield Refractories Co.
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
Western Gas Construction Co.

BRUSHES, PIPE CLEANING
Safety Gas Main Stopper Co.

B. T. U. INDICATORS
United Engineers & Constructors

BUCKETS—CLAMSHELL
Geo. Haiss Mfg. Co.

BURNERS (Industrial)
Fuel
The C. M. Kemp Mfg. Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Carl Still, Incorporated.
Internat'l Coal Carbonization Co.
The Gas Machinery Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
Western Gas Construction Co.

CABLE RAILWAYS
C. W. Hunt Co., Inc.

CALORIMETERS
Alpha-Lux Company (Inc.).
American Meter Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works

CARBONIZATION
Low Temperature
Internat'l Coal Carbonization Co.

CARBURETTED WATER GAS PLANTS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

CARS
C. W. Hunt Co., Inc.

CASING, SEAMLESS STEEL
Pittsburgh Steel Products Co.

CAST IRON FITTINGS
James B. Clow & Sons

CEMENTS
Botfield Refractories Co.
The Jersey City Refractories Co. Inc.
Russell Engineering Co.

CEMENTS, ACID-PROOF
Quigley Furnace Spec. Co., Inc.

CEMENTS, FIREBRICK
Botfield Refractories Co.
Quigley Furnace Spec. Co., Inc.

CEMENTS, HIGH TEMPERATURE
Refractory
Botfield Refractories Co.
E. J. Lavino & Co.
Quigley Furnace Spec. Co., Inc.

CHARGING MACHINERY
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Western Gas Const. Co.

CHUTES
C. W. Hunt Co., Inc.

CLAMPS (PIPE)
S. R. Dresser Manufacturing Co.
Mueller Co.

COALS
Boone County Coal Corp.
Pittsburgh Coal Co.
Westmoreland Coal Co.

COAL GAS APPARATUS
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.

COAL & COKE BINS CASTINGS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
Geo. Haiss Mfg. Co.
C. W. Hunt Co., Inc.
Dry Quenching Equipment Corp.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
Western Gas Construction Co.

COAL TAR PRODUCTS
Western Gas Construction Co.

COAL TUBS
C. W. Hunt Co., Inc.

COCKS
Angle Stove
Mueller Co.
Boiler Drain
Mueller Co.
Hose
Mueller Co.
Meter
Kitson Company
Mueller Co.
Service
Kitson Co.
Mueller Co.

COKE CRUSHERS
Semet Solvay Engineering Corp.

COKE QUENCHING
Dry Quenching Equipment Corpn.

COMPUTERS
Heating Value
United Engineers & Constructors

CONDENSERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.
High Duty
United Engineers & Constructors

CONTRACTORS' TUBS
C. W. Hunt Co., Inc.

CONTROLS
Am. Schaeffer & Budenberg Corp.
Bartlett-Hayward Co.
The Gas Machinery Co.
Robertshaw Thermostat Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
United Engineers & Constructors
Taylor Instrument Cos.
Western Gas Construction Co.
Hot Water Heat System
Mueller Co.

CONVEYORS
Geo. Haiss Mfg. Co.
C. W. Hunt Co., Inc.
Isbell-Porter Co.
The Koppers Construction Co.
Semet Solvay Engineering Corp.

CONCENTRATORS AMMONIA
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp.

COOLERS
Andale Co.
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

COOLING COILS
Semet-Solvay Engineering Corpn.

COUPLINGS
Bartlett-Hayward Co.
S. R. Dresser Manufacturing Co.
National Tube Co.
P. H. & F. M. Roots Co.

CRUSHERS
C. W. Hunt Co., Inc.

DE-EMULSIFIERS
Semet-Solvay Engineering Corpn.

DEHYDRATORS, GAS
Andale Co.

DERRICK—PIPE
Safety Gas Main Stopper Co.

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Russell Engineering Co.

DOMESTIC INCINERATORS
Kernit Incinerator Co.

DRAFT GAUGES
Am. Schaeffer & Budenberg Corp.
Bristol Co., The
Precision Ther. & Inst. Co.

DRILLING MACHINES
Mueller Co.

ELECTRIC LOCOMOTIVES
C. W. Hunt Co., Inc.

ELEVATORS
Craig Ridgway & Son Co.

ENGINE INDICATORS
Am. Schaeffer & Budenberg Corp.

ENGINEERS
Combustion
Bartlett-Hayward Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Smoot Engineering Corp.
Consulting
Bartlett-Hayward Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
George H. Waring
Contracting
Andale Co.
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Isbell-Porter Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.

EXHAUSTERS
The Connersville Blower Co.
The Gas Machinery Co.
Isbell-Porter Co.
P. H. & F. M. Roots Co.
The Stacey Mfg. Co.
United Engineers & Constructors

EXPANSION BENDS
Mueller Co.

FILES (Steel and Wood)
Remington Rand Business Service, Inc.

FIREBRICK—CHECKER BRICK
Botfield Refractories Co.
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Co.
United Engineers & Constructors
Western Gas Construction Co.

FIREBRICK, CEMENT
Botfield Refractories Co.
Quigley Furnace Spec. Co., Inc.

FITTINGS
Isbell-Porter Co.
The Gas Machinery Co.
Mueller Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe & Fdy. Co.
Western Gas Construction Co.

FITTINGS, FLANGED
U. S. Cast Iron Pipe & Fdy. Co.

FITTINGS
Pipe
American Cast Iron Pipe Co.
Semet-Solvay Engineering Corp.

FIXTURES
General Gas Light Co.
Welsbach Co.

FLOORS, IRON, BRICK AND STEEL
Western Gas Construction Co

FLUE PIPE (Cast Iron Oval)
James B. Clow & Sons

WESTMORELAND "CRITERION" GAS COAL

The Standard for Gas Making Since 1854

Since this Company commenced operations, its well-known Westmoreland "Criterion" Gas Coal has been largely used by the Gas Companies of Northeastern United States and Canada, and its character is established as having no superior in gas giving qualities and freedom from sulphur and other impurities.

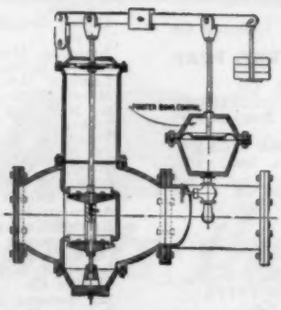
Mines situated on the Pennsylvania Railroad,
in Westmoreland County, Pa.

THE WESTMORELAND COAL COMPANY

Principal Office, Lewis Building, 15th and Locust Sts., Philadelphia, Pa.

Shipping Ports: Philadelphia, Baltimore, South Amboy, N. J., Lake Ports.

GROBLE
REGULATORS & GOVERNORS



Industrial customers served with one pound or more pressure require sensitive regulation and positive lock-off. Master Bowl control insures both.

GROBLE GAS REGULATOR COMPANY

Anderson, Indiana

Representatives

Utilities Service Co., Peoples Gas Building, Chicago.
H. E. Broughton, 404 Donovan Building, Detroit.
The Worrall Co., 472 Central Ave., East Orange, N. J.
Midland Supply Co., Dwight Building, Kansas City, Mo.
Seidenglanz & Co., Second Unit, Santa Fe Bldg., Dallas.

LEADING GAS COMPANIES USE LAMBERT METERS

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

LAMBERT METER CO.

BUSH TERM. BLDG. 4, BROOKLYN, N. Y.

LAVINO OXIDE

Intensely Active. High Total Sulphur Absorption at Minimum Cost.

"THE EFFICIENT PURIFIER"

The Sponge with the large Tough Shavings Always Uniform

LAVINO SPONGE

E. J. LAVINO and COMPANY - BULLITT BLDG. - PHILADELPHIA, PA.
NEW YORK CHICAGO PITTSBURGH

Buyers' Reference Index

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FLUES (Consuming) for Gas Range
Akme Flue, Inc.
FURNACES
Gas Fired
Warm Air
Geo. D. Roper Co.
GAS ANALYSIS APPARATUS
American Meter Co.
S. R. Dresser Manufacturing Co
Metric Metal Works
Precision Ther. & Inst. Co.
United Engineers & Constructors
GASKETS
Southwestern Pipe Joint & Engineering Co.
Safety Gas Main Stopper Co.
GAS MASKS
Safety Gas Main Stopper Co.
GAS PLANTS, COMPLETE
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Gas Machinery Co.
Gas Engineering Co.
The Improved Equipment Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp
The Stacey Bros. Gas Const. Co
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.
West Gas Improvement Co.
GAS TESTING APPARATUS
Alpha-Lux Company, Inc.
Lambert Meter Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
Precision Ther. & Inst. Co.
Superior Meter Co.
United Engineers & Constructors
GAUGE BOARDS
Am. Schaeffer & Budenberg Corp.
Western Gas Construction Co.
GAUGES
Am. Schaeffer & Budenberg Corp.
American Meter Co.
The Bristol Co.
Connelly Iron Sponge & Gov. Co
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
Metric Metal Works
Safety Gas Main Stopper Co.
Taylor Instrument Companies
Pressure-Recording
American Schaeffer & Budenberg Co
D. McDonald & Co.
Superior Meter Co.
GLOVES
Rubber
Leather
Safety Gas Main Stopper Co.
GOVERNORS
The Stacey Mfg. Co.
Automatic
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Coke Oven
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
The Gas Machinery Co.
The Koppers Construction Co.
Pittsburgh Equitable Meter Co.
Semet Solvay Engineering Corp
Smoot Engineering Corp.
District
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov Co.
Groble Gas Regulator Co.
Helme & McIlhenny
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
Exhauster
Chaplin-Fulton Mfg Co.
Connelly Iron Sponge & Gov. Co.
The Connersville Blower Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co
Smoot Engineering Corp.
High Pressure
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
P. H. & F. M. Roots Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Laboratory
D. McDonald & Co.
Low Pressure
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
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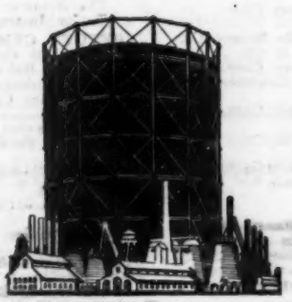

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AUTHORITY

Prepared and edited by the Technical Section of the Pacific Coast Gas Association under the supervision of E. L. Hall of the Portland (Oregon) Gas & Coke Company, Chairman of the Section. The special committee which compiled this volume was headed by R. M. Conner, now Director of the Gas Appliance Testing Laboratory of the American Gas Association. Mr. Conner was assisted by Walter M. Berry, formerly Gas Engineer of the Bureau of Standards and now Executive Engineer of the California Gas Research Council, and Prof. S. H. Graf of the Oregon State Agricultural College.

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G-515—Iron Body Gas Cock, Lock Wing, with Brass Key

G-415—Flat Head Key

G-401—Flat Head Key

G-211—Flat Head Key

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EXECUTIVE OFFICES
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Philadelphia, September 1, 1928.

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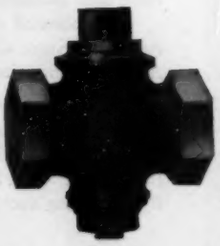

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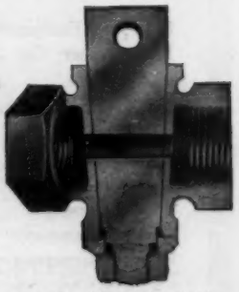

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